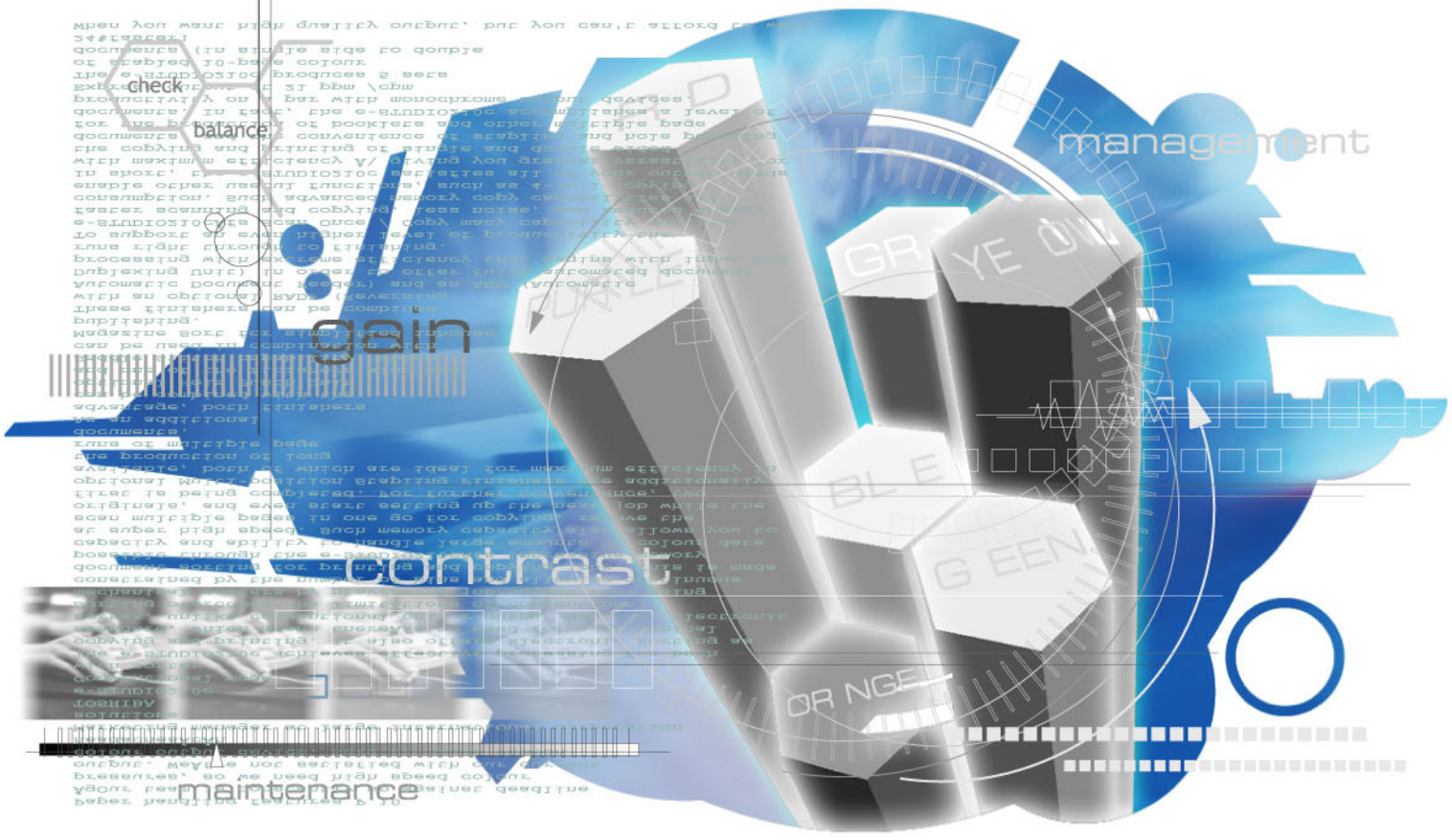
TOSHIBA

e-STUDIO350/450

e-STUDIO200L/230/230L/280/280s

Satisfying Specific Customer Needs for Designed Image Quality

Imaging Manual



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Revision Record

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Date	Rev. No.	Item	Descriptions	Remarks
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Purpose of the Imaging Manual

The Imaging Manual is intended for customers using the Toshiba e-STUDIO350/450 and e-STUDIO200L/230/230L/280/280S with a variety of specific needs and inquiries for high image quality, such as:

- How to obtain a clearer copy image
- How to maintain the current image quality
- How to make the text look sharper on the copy

The Toshiba MFPs are factory-configured to provide image quality settings that satisfy the majority of customers. However, these settings may not be necessarily optimal for all specific needs from customers. Proper image quality adjustments can satisfy such needs. Most of the adjustments described in this manual must be performed by a service technician, but a few of them can also be performed by the customer.

It is strongly recommended that this manual be fully utilized by not only the service technician, but also the sales representative, who also has opportunities of obtaining customer feedback on the image quality. This manual helps the sales representative to study and comprehend what kind of customer needs for the image quality can be satisfied, to make a proposal to the customer for improving image quality, and to communicate the customers needs with ease to the service technician. In addition, this manual is expected to facilitate the marketing of the Toshiba MFPs to prospective customers that have specific demand for image quality and the expansion of sales.

The adjustments described in this manual are all based on the needs of actual customers. Meeting their specific needs will increase their satisfaction.

Please remember to read "Cautions after the completion of the adjustment," which you must pay close attention to, after the completion of the adjustment.

Precautions in Servicing

- For adjustments to be performed by the service technician, the cautions mentioned in the Service Manual must be stringently followed. The adjustments must be performed by a qualified service technician who has completed the service training course.
- The default values mentioned in this manual may be different from the actual ones, due to the timing of shipping (firmware version). But note that the values recommended and acceptable value range mentioned in this manual remain the same.

Icons

The following icons used in this manual denotes the following:

PCL6 : An adjustment having an effect on printing on the Windows PCL6 emulation printer driver

PS3 : An adjustment having an effect on printing on the Windows PS3 emulation printer driver

Mac : An adjustment having effect on printing on the Macintosh printer driver

Scan to Box : An adjustment having an effect on the image stored in the e-Filing box by the scanning functions (including Scan to Box, Scan to File and Scan to E-mail)

Copy to Box : An adjustment having an effect on the image stored in the e-Filing box by the copying functions (Copy to Box)

1. General Adjustments – Copying, Printing and e-Filing (Output from Box)

1.1 To Obtain a High-density Black Area (Solid black area)
1.2 To Obtain a Darker Image
1.3 To Achieve the Image Quality Most Suitable for Paper Used
(To prevent the image printed on the back of the paper from being blotched in duplex mode)
1.4 To Fix the Sufficient Amount of Toner on a Photo or Gradational Image
(To improve the fusibility of the toner and reduce the frequency of the copier pausing during the copying/printing operation)
1.4.1 To Adjust the e-STUDIO350/450
1.4.2 To Adjust the e-STUDIO200L/230/230L280/280S

2. Copier-specific Adjustments

2.1 To Sharply Copy Light Text or Thin Lines
2.2 To Copy Handwritten Text More Sharply and Darkly
2.3 To Eliminate the Background Color
2.4 To Eliminate Moiré
2.5 To Clearly Copy at the Trailing Edge of the Paper in Duplex Copying
(To adjust the bottom margin on the back of the page in duplex copying)
2.6 To Adjust Reproducibility to Uses in Photo Mode
(To attach importance to halftone reproducibility, text reproducibility or reduction in moiré)
2.7 To Program Frequently Used Copy Settings (To use Custom mode)

3. Printer-specific Adjustments

3.1 To Clearly Print Lines or Text (To adjust density or thickness of lines or text)
3.1.1 To Clearly Print Light-colored Thin Lines or Text (To make the dots smaller)
3.1.2 To Print Light-colored Lines or Text More Darkly
3.1.3 To Print Thinner Lines or Text
3.2 To Clearly Print the Thin Lines / White Lines on the Black Background
3.3 To Decrease the Image Density and Save Toner
3.3.1 To Perform Printing in Toner Save Mode
3.3.2 To Adjust the Laser Power Output (e-STUDIO350/450 only)
3.3.3 To Adjust the Image Density Level
3.4 To Adjust the Image Density in Toner Save Mode
3.4.1 To Adjust the Laser Power Output in Toner Save Mode (e-STUDIO350/450 only)
3.4.2 To Adjust the Image Density Level in Toner Save Mode
3.5 To Print Illegible Gray or Colored Text in Black
3.6 To Ignore Blank Pages for Printing

4. e-Filing-specific Adjustments

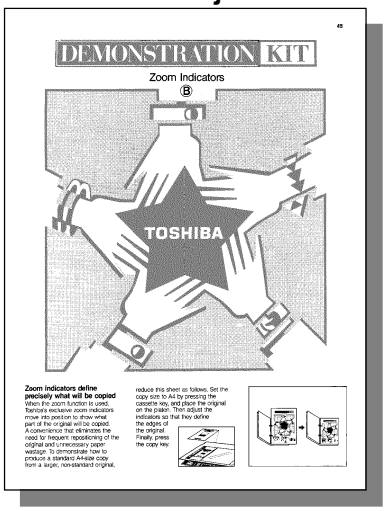
4.1 To Store the B/W Original with Photos and Text with the High Density (To change the density in Copy to Box)
4.2 To Store the Original Attaching Importance to Gradation Reproducibility of Printed Image (To change gradation of the image scanned and stored by Scan to Box)

5. Scanning-specific Adjustments

5.1 To Scan the Original, while Reducing the File Size
5.2 To Sharply Scan the Original (To increase the sharpness intensity)

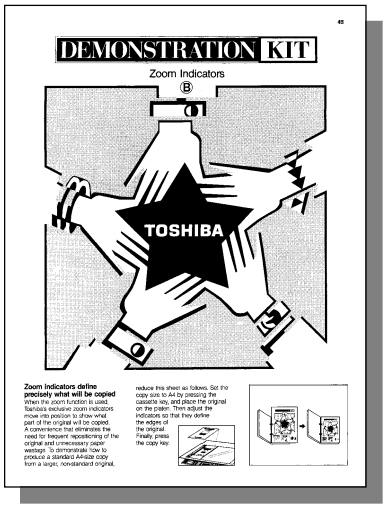
1.1 To Obtain a High-density Black Area (Solid black area)

Before the adjustment



The black area looks slightly blurred on the copy.

After the adjustment



The black area looks clear on the copy.

❑ Explanation

When an original containing a large-sized logo or a graphic image is copied or printed out, the solid black area sometimes looks slightly blurred on the copy. Adjust the toner density, transfer transformer DC output and laser power output, in order to fix the sufficient amount of toner on the solid black area and obtain a clearer image output.

❑ Procedures

* The service technician must perform the adjustment in accordance with the procedures below.

(1) Enter setting mode [08]. Change the value for code [414] to increase the toner density in the developer material.

For e-STUDIO350/450

• Set "1," "2," "3," and "4" for code 08-414 in order and increase the toner density gradually, while visually checking a change in the image quality.

Value for 08-414	Toner density
0	Default
1	Approximately 0.5 wt% higher than the default value
2	Approximately 1.0 wt% higher than the default value
3	Approximately 1.5 wt% higher than the default value
4	Approximately 2.0 wt% higher than the default value

For e-STUDIO200L/230/230L/280/280S

• Set "1," "2," and "3" for code 08-414 in order and increase the toner density gradually, while visually checking a change in the image quality.

Value for 08-414	Toner density
0	Default
1	Approximately 0.3 wt% higher than the default value
2	Approximately 0.6 wt% higher than the default value
3	Approximately 0.9 wt% higher than the default value

<Notes> • The effect of the toner density adjustment cannot be determined or a change in the image quality cannot be identified, until approximately 50 copies are made after the completion of the adjustment. The effect of the adjustment can also be determined by the frequency of toner supply. When the toner supply operation is performed frequently after the adjustment, you can identify a gradual increase in toner density.

• Increasing the toner density may possibly cause an increase in the amount of toner consumed, scattering of the toner, fogged images, diminished photo images or gradations (less accurate reproduction of halftones), extremely dark images (decreased resolving power), and loss of the life in the consumables. Therefore, carefully perform the adjustment, while checking the copy or print image.

• An image quality problem may occur when the copier is used for a while after the toner density is adjusted. Do not change the toner density value from the default unless necessary.

After increasing the toner density, print and check the image quality.
If further image quality adjustments are still necessary, use the next procedure.

(2) Change the value for adjustment mode [05] or setting mode [08] to increase the toner transfer efficiency.

For e-STUDIO350/450

Enter adjustment mode [05]. Increase the value for code [221] to increase the toner transfer efficiency.

• Before changing the value for code 05-221, remove the developer unit from the copier. Use steps (a) to (e) to make the setting.

(a)Change the value for code 08-203to "1."

(b)Remove the developer unit from the copier.

(c)Check the value set for code 05-221.

* The value set for code 05-221 varies on a machine-by-machine basis, because it is adjusted prior to shipment, in accordance with the characteristics of each machine.

(d) Increase the value for code 05-221 by 15.

* For instance, if the current value is "114," change it to "129."

(e) Reinstall the developer unit to the copier.

(f) Reset the value for code 08-203 to "0."

<Notes> • Setting "1" for code 08-203 allows the copier to be placed in line adjustment mode. While the copier is in line adjustment mode, the high voltage output life control is disabled. Therefore, if the copier is continuously used in line adjustment mode, this may cause significant reduction in the life of consumables and many kinds of image quality problems. Therefore, once you have changed the value for code 08-203 as described above, remember to reset it to "0."

• Increasing the transfer charger output (toner transfer efficiency) may possibly cause blotched images and diminished photo images or gradations (less accurate reproduction of halftones). Therefore, carefully perform the adjustment, while checking the copy or print image.

• As an image quality problem may occur, do not change the transfer charger output value from the default unless necessary.

For e-STUDIO200L/230/230L/280/280S

Enter setting mode [08]. Change the value for codes [830], [868], and [869] to increase the toner transfer efficiency.

* The following three setting codes are available for transfer charger output depending on the paper transfer position: leading edge, center, and trailing edge. Change the value for all three setting codes equally to perform the adjustment.

• To adjust the transfer charger output at the leading edge of the paper:
Increase the current 08-868 value by 15. (The default value is "128.")

• To adjust the transfer charger output at the center of the paper:
Increase the current 08-830 value by 15. (The default value is "128.")

• To adjust the transfer charger output at the trailing edge of the paper:
Increase the current 08-869 value by 15. (The default value is "128.")

<Notes> • Increasing the transfer charger output (toner transfer efficiency) may possibly cause blotched images and diminished photo images or gradations (less accurate reproduction of halftones). Therefore, carefully perform the adjustment, while checking the copy or print image.

• As an image quality problem may occur, do not change the transfer charger output value from the default unless necessary.

After increasing the toner transfer efficiency, print and check the image quality.
If further image quality adjustments are still necessary, use the next procedure.

(3) Enter setting mode [08]. Increase the values for codes [872], [873] and [876] to increase the intensity of the laser, which the drum is irradiated with.

To adjust the copy image quality

• In Text/Photo mode: Change the value for code 08-873 to "143." (The default value is "128.")
• In Text mode: Change the value for code 08-876 to "143." (The default value is "128.")

To adjust the print image quality

Change the value for code 08-872 to "143." (The default value is "128.")

<Notes> • Increasing the intensity of the laser may possibly cause diminished photo images or gradations (less accurate reproduction of halftones) and extremely dark images (decreased resolving power). Therefore, carefully perform the adjustment, while checking the copy or print image.

• As an image quality problem may occur, do not change the intensity value of the laser from the default unless necessary.

❑ Cautions after the completion of the adjustment

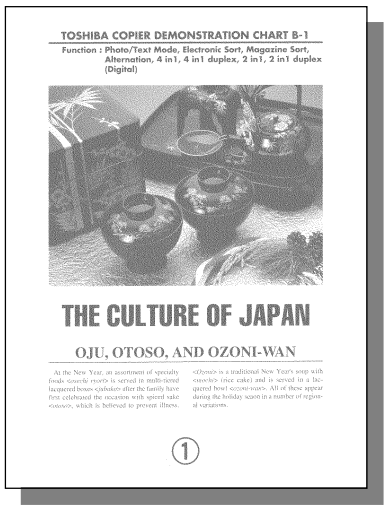
The adjustment may possibly cause an increase in the amount of toner consumed, scattering of the toner, fogged images, blotched images, diminished photo images or gradations (less accurate reproduction of halftones), extremely dark images (decreased resolving power), and loss of the life in the consumables. Therefore, carefully perform the adjustment, while checking the copy or print image.

❑ Remarks

The effect of the adjustment may vary, depending on the usage pattern of the consumables, such as the developer material and drum, and the operating environment of the copier.

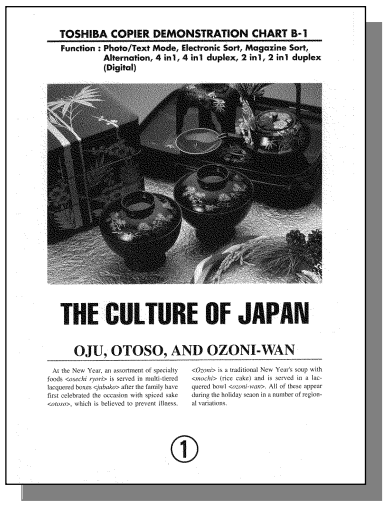
1.2 To Obtain a Darker Image

Before the adjustment


TOSHIBA COPIER DEMONSTRATION CHART B-1
Function : Photo/Text Mode, Electronic Sort, Magazine Sort, Alternation, 4 in1, 4 in1 duplex, 2 in1, 2 in1 duplex (Digital)
THE CULTURE OF JAPAN
OJU, OTOSO, AND OZONI-WAN
①

The copy image looks light and blurred.

After the adjustment


TOSHIBA COPIER DEMONSTRATION CHART B-1
Function : Photo/Text Mode, Electronic Sort, Magazine Sort, Alternation, 4 in1, 4 in1 duplex, 2 in1, 2 in1 duplex (Digital)
THE CULTURE OF JAPAN
OJU, OTOSO, AND OZONI-WAN
①

The entire image looks darker and sharper.

❑ Explanation

When an original containing a photo or gradations is copied or printed out, the entire image may sometimes look light and blurred. Adjust the original exposure condition and toner density, in order to obtain the darker and sharper copy image.

❑ Procedures

* Perform the adjustments in order as listed below.
* Procedures (1) and (3) are used by the service technician only.
* Procedure (2) is used by the service technician, and by the user.
* Procedures (1) and (2) adjust the copy image quality only. On the other hand, procedure (3) adjusts the quality of both copy and print images.

(1) Enter adjustment mode [05]. Increase the value for code [501/503/504] or [512/514/515] to scan the original with the higher density. (Change the original exposure condition.)

• The code to use varies, according to the copy density mode (manual or automatic) and original mode (Photo, Text/Photo or Text). Adjust the value for the [05] code corresponding to the copy density mode and original mode for which you would like to improve the image quality. Increase the value by 20 to 30 as a guideline.

Manual copy density mode

Original mode	[05] code	Value recommended	Acceptable value range	Default
Text/Photo	05-503	Current value + 20 to +30	0 to 255	128
Photo	05-501	Current value + 20 to +30	0 to 255	128
Text	05-504	Current value + 20 to +30	0 to 255	128

Automatic copy density mode

Original mode	[05] code	Value recommended	Acceptable value range	Default
Text/Photo	05-514	Current value + 20 to +30	0 to 255	128
Photo	05-512	Current value + 20 to +30	0 to 255	128
Text	05-515	Current value + 20 to +30	0 to 255	128

<Note> This adjustment will affect only the copy image quality, but not the print image quality.

After increasing the copy density, copy and check the image quality.
If further image quality adjustments are still necessary, use the next procedure.

(2) Press the [BASIC] button on the Control Panel. Select "TEXT" from among the original mode options.

*To have "TEXT" selected from among the original mode options by default, use the following procedures:

To change default original mode on the Control Panel

• Use steps (a) to (d) to change default original mode.

(a) Press the [USER FUNCTIONS] button on the Control Panel to enter the "User Functions" menu.

(b) Press the [USER] button.

(c) Press the [COPY] button.

(d) In the "ORIGINAL MODE" option, press the [TEXT] button.

To change default original mode in setting mode [08]

• Enter setting mode [08]. Change the value for code [550] to switch the original mode option from "TEXT/PHOTO" to "TEXT."

• Change the value for code 08-550 to "2."

Value for 08-550	Default original mode at power-on
0	Text/Photo (default)
1	Photo
2	Text
3	Custom

*Custom mode can be selected, if it has already been enabled using code 08-508. For further information regarding the Custom mode setting, refer to 2.7 To Program Frequently Used Copy Settings.

<Note> This adjustment will affect only the copy image quality, but not the print image quality.

After selecting Text mode, copy and check the copy image quality.
If further image quality adjustments are still necessary, use the next procedure.

(3) Enter setting mode [08]. Change the value for code [414] to increase the toner density in the developer material.

For e-STUDIO350/450

• Set "1," "2," "3," and "4" for code 08-414 in order and increase the toner density gradually, while visually checking a change in the image quality.

Value for 08-414	Toner density
0	Default
1	Approximately 0.5 wt% higher than the default value
2	Approximately 1.0 wt% higher than the default value
3	Approximately 1.5 wt% higher than the default value
4	Approximately 2.0 wt% higher than the default value

For e-STUDIO200L/230/230L/280/280S

• Set "1," "2," and "3" for code 08-414 in order and increase the toner density gradually, while visually checking a change in the image quality.

Value for 08-414	Toner density
0	Default
1	Approximately 0.3 wt% higher than the default value
2	Approximately 0.6 wt% higher than the default value
3	Approximately 0.9 wt% higher than the default value

<Notes> • The effect of the toner density adjustment cannot be determined or a change in the image quality cannot be identified, until approximately 50 copies are made after the completion of the adjustment. The effect of the adjustment can also be determined by the frequency of toner supply. When the toner supply operation is performed frequently after the adjustment, you can identify a gradual increase in toner density.

• Increasing the toner density may possibly cause an increase in the amount of toner consumed, scattering of the toner, fogged images, diminished photo images or gradations (less accurate reproduction of halftones), extremely dark images (decreased resolving power), and loss of the life in the consumables. Therefore, carefully perform the adjustment, while checking the copy or print image.

• An image quality problem may occur when the copier is used for a while after the toner density is adjusted. Do not change the toner density value from the default unless necessary.

❑ Cautions after the completion of the adjustment

The adjustment may possibly cause an increase in the amount of toner consumed, scattering of the toner, fogged images, diminished photo images or gradations (less accurate reproduction of halftones), extremely dark images (decreased resolving power), and loss of the life in the consumables. Therefore, carefully perform the adjustment, while checking the copy or print image.

❑ Remarks

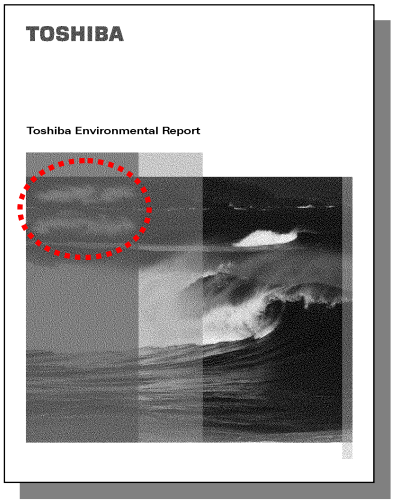
• Enter the value mentioned in the procedures or one within the recommended value range for the adjustment. Otherwise, it may cause a loss in copier performance, including degradation in the image quality and reduction in the life of the consumables.

• The effect of the adjustment may vary, depending on the usage pattern of the consumables, such as the developer material and drum, and the operating environment of the copier.

1.3 To Achieve the Image Quality Most Suitable for Paper Used

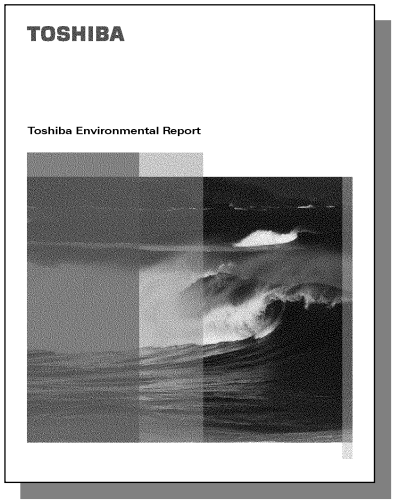
(To prevent the image printed on the back of the paper from being blotched in duplex mode)

Before the adjustment



The image, which is printed on the back of the paper, may be blotched in duplex mode, depending on the type of paper used.

After the adjustment



The image quality most suitable for the paper used is obtained.

❑ Explanation

When an original containing halftones, such as a photo or gradations, is copied or printed out in duplex mode, the halftone image on the back of the paper (or the printed side that is delivered facing downwards in duplex mode) may sometimes be blotched, depending on the type of paper used. Adjust the transfer charger output value in duplex mode, in order to prevent the image from being blotched and obtain a clear image quality.

* This adjustment will be effective, only if the image printed on the back of the paper is blotched in duplex mode. Remember that it will not affect the quality of the image printed on the front of the paper (or the printed side in simplex mode or the side that is delivered facing upwards in duplex mode).

❑ Procedure

* The adjustment is performed by the service technician only.

(1) Change the value for setting mode [08] to adjust the transfer charger output, when the image is printed on the back of the paper. (Decrease the transfer charger output value, in order to prevent the image from being blotched and finely reproduce halftones.)

For e-STUDIO350/450

Enter setting mode [08]. Change the value for code [492] to adjust the transfer charger bias output value, when the image is printed on the back of the paper.

• Change the value for code 08-492 to "91." (The default value is "106.")

* Code 08-492 is intended to adjust the transfer charger bias output value, when the image is printed on the back of the paper. Remember that using this code will not affect the quality of the image printed on the front of the paper (or the printed side in simplex mode or the side that is delivered facing upwards in duplex mode).

For e-STUDIO200L/230/230L/280/280S

Enter setting mode [08]. Change the value for code [491], [492], and [493] to adjust the transfer charger output, when the image is printed on the back of the paper.

* The following three setting codes are available for transfer charger output depending on the paper transfer position: leading edge, center, and trailing edge. Change the value for all three setting codes equally to perform the adjustment.

• To adjust the transfer charger output at the leading edge of the paper when the image is printed on the back of the paper:
Decrease the current 08-491 value by 20. (The default value is "149.")

• To adjust the transfer charger output value at the center of the paper when the image is printed on the back of the paper:
Decrease the current 08-492 value by 20. (The default value is "139.")

• To adjust the transfer charger output value at the trailing edge of the paper when the image is printed on the back of the paper:
Decrease the current 08-493 value by 20. (The default value is "128.")

* Codes 08-491, 08-492, and 08-493 are intended to adjust the transfer charger output, when the image is printed on the back of the paper. Remember that using this code will not affect the quality of the image printed on the front of the paper (or the printed side in simplex mode or the side that is delivered facing upwards in duplex mode).

<Hint> • "Dither" is selected as the gradation processing method by default in Photo mode. Dither is intended to reproduce finer and smoother halftones. If a double-sided copy/print is made in Photo mode, the image on the back of the paper may not be blotched, unlike the case where it is made in Text/Photo or Text mode (default gradation processing method: error diffusion).

• The image on the back of the paper may be blotched, depending on the direction of the fibers of paper used. Therefore, changing the paper orientation may sometimes prevent the image from being blotched. For instance, when a double-sided copy/print is made on A4/LT-sized paper in portrait orientation, the image on the back of the paper may be blotched. But if it is made on A4/LT-sized paper in landscape orientation (A4-R/LT-R), the image may no longer be blotched.

• After adjusting the transfer charger bias output value, print and check the image quality.

❑ Cautions after the completion of the adjustment

The adjustment may slightly decrease the darkness of a solid filled area printed on the back of the paper. Therefore, carefully perform the adjustment, while checking the copy or print image.

❑ Remarks

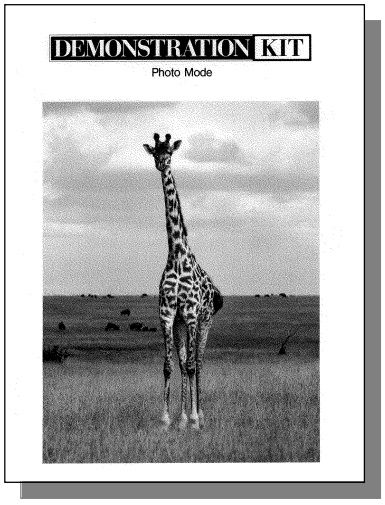
• Enter the value mentioned in the procedures. Otherwise, it may produce little effect on the image quality. In addition, it may cause a loss in copier performance, including degradation in the image quality and reduction in the life of the consumables.

• The effect of the adjustment may vary, depending on the usage pattern of the consumables, such as the developer material and drum, and the operating environment of the copier.

• The desired image quality may not be obtained, depending on the type of paper used. In this case, use the recommended paper and then print or adjust the image quality.

1.4 To Fix the Sufficient Amount of Toner on a Photo or Gradational Image

(To improve the fusibility of the toner and reduce the frequency of the copier pausing during the copying/printing operation)



Particularly when this type of gradational image is copied or printed on thick paper with the higher density, the toner may easily peel off (on rare occasion).

❑ Explanation

When an original containing halftones, such as a photo or gradations is copied or printed out, the toner may easily peel off (on rare occasion), depending on the type of paper used, operating conditions or environment of the copier. Change the fuser unit control method, in order to make the toner fully fixed on any type of paper and to prevent the copier from frequently pausing during its copying or printing.

❑ Procedures

* The procedure varies depending on the model of the copier. To adjust the e-STUDIO350/450, refer to "1.4.1 To Adjust the e-STUDIO350/450" and to adjust the e-STUDIO200L/230/230L/280/280S, refer to "1.4.2 To Adjust the e-STUDIO200L/230/230L/280/280S."

1.4.1 To Adjust the e-STUDIO350/450

* You can start with any of the procedures, but an adjustment should be prioritized, if necessary.
* The service technician must perform the adjustment in accordance with the procedures below.
* Procedure (1) will be effective, if all types of paper, including plain paper, are used.
* Procedure (2) will be effective, if thick paper mode or TRANSPARENCY (OHP film) mode is used.

(1) Enter setting mode [08]. Change the value for code [420] to change the fuser unit control method.
(It is intended to increase the interval during which pre-running is performed, while the fuser unit is being warmed up, in order to improve the fusibility of the toner immediately after the warm-up time.)

• Change the value for code 08-420 to "10." (The default value is "4.")

Value for 08-420	Pre-running interval during the warm-up time
4	4 seconds
10	10 seconds

<Note> This adjustment will slightly increase the warm-up time.

(2) Enter setting mode [08]. Change the value for code [417], [439], [441] or [526] to specify the fuser unit control method in thick paper mode or TRANSPARENCY (OHP film) mode.
(It is intended to specify whether to perform pre-running prior to printing or change the pre-running interval, in order to improve the fusibility of the toner in each paper mode.)

To print in "THICK1" mode

• Change the value for code 08-441 to "10." (The default value is "0.")

Value for 08-441	Pre-running interval prior to printing
0	No pre-running
10	10 seconds

To print in "THICK2" mode

• Change the value for code 08-439 to "10." (The default value is "0.")

Value for 08-439	Pre-running interval prior to printing
0	No pre-running
10	10 seconds

To print in "THICK3" mode

• Change the value for code 08-417 to "10." (The default value is "0.")

Value for 08-417	Pre-running interval prior to printing
0	No pre-running
10	10 seconds

To print in "TRANSPARENCY (OHP FILM)" mode

• Change the value for code 08-526 to "10." (The default value is "6.")

Value for 08-526	Pre-running interval prior to printing
6	6 seconds
10	10 seconds

* This adjustment will also prevent offset failure, when copying or printing is performed in TRANSPARENCY (OHP film) mode.

<Note> This adjustment will slightly slow down the copying or printing speed.

* The table below shows you the acceptable paper weight for the paper types.

Paper type	Acceptable paper weight	
Thick 1	81 to 105 g/m²	Max. 28 lb. Bond
Thick 2	106 to 163 g/m²	Max. 43 lb. Bond / 90 lb. Index
Thick 3	164 to 209 g/m²	Max. 55 lb. Bond / 110 lb. Index

❑ Cautions after the completion of the adjustment

The adjustment may possibly increase power consumption and slow down the copying or printing speed. Therefore, carefully perform the adjustment, while checking the copy or print image.

1.4.2 To Adjust the e-STUDIO200L/230/230L280/280S

* You can start with any of the procedures, but an adjustment should be prioritized, if necessary.
* The service technician must perform the adjustment in accordance with the procedures below.
* Procedure (1) is to change the pre-running interval during the warm-up time and will be effective if all types of paper, including plain paper, are used.
* Procedure (2) is to change the pre-running interval prior to printing and will be effective if plain paper mode is used at low temperature or if thick paper mode, TRANSPARENCY (OHP FILM) mode, or ENVELOPE mode is used.

(1) Enter setting mode [08]. Change the value for code [423] or [517] to specify the pre-running interval during the warm-up time at normal or low temperature.
(It is intended to increase the interval during which pre-running is performed, while the fuser unit is being warmed up, in order to improve the fusibility of the toner immediately after the warm-up time.)

To print at normal temperature (copier internal temperature: 16 °C or more)

• Change the value for code 08-517 to "6." (The default value is "0.")

Value for 08-517	Pre-running interval during the warm-up time
0	No pre-running
6	30 seconds

To print at low temperature (copier internal temperature: Less than 16 °C)

• Change the value for code 08-423 to "9." (The default value is "6.")

Value for 08-423	Pre-running interval during the warm-up time
6	30 seconds
9	60 seconds

<Note> This adjustment will increase the warm-up time by specifying a longer pre-running interval. A short pre-running interval reduces the fusibility.

(2) Enter setting mode [08]. Change the value for code [417], [439], [440], [441], [523], or [526] to specify the pre-running interval prior to printing for printing in plain paper mode at low temperature or for printing in thick paper mode, TRANSPARENCY (OHP FILM) mode, or ENVELOPE mode.
(It is intended to change the pre-running interval prior to printing, in order to improve the fusibility of the toner in each paper mode.)

To print on plain paper at low temperature (copier internal temperature: Less than 16 °C)

• Change the value for code 08-440 to "10." (The default value is "0.")

Value for 08-440	Pre-running interval prior to printing
0	No pre-running
10	10 seconds

To print in "THICK1" mode

• Change the value for code 08-441 to "10." (The default value is "0.")

Value for 08-441	Pre-running interval prior to printing
0	No pre-running
10	10 seconds

To print in "THICK2" mode

• Change the value for code 08-439 to "15." (The default value is "10.")

Value for 08-439	Pre-running interval prior to printing
10	10 seconds
15	20 seconds

To print in "THICK3" mode

• Change the value for code 08-417 to "15." (The default value is "10.")

Value for 08-417	Pre-running interval prior to printing
10	10 seconds
15	20 seconds

To print in "TRANSPARENCY (OHP FILM)" mode

• Change the value for code 08-526 to "10." (The default value is "0.")

Value for 08-526	Pre-running interval prior to printing
0	No pre-running
10	10 seconds

To print in "ENVELOPE" mode

• Change the value for code 08-523 to "15." (The default value is "10.")

Value for 08-523	Pre-running interval prior to printing
10	10 seconds
15	20 seconds

<Note> This adjustment will slightly slow down the copying or printing speed.

* The table below shows you the acceptable paper weight for the paper types.

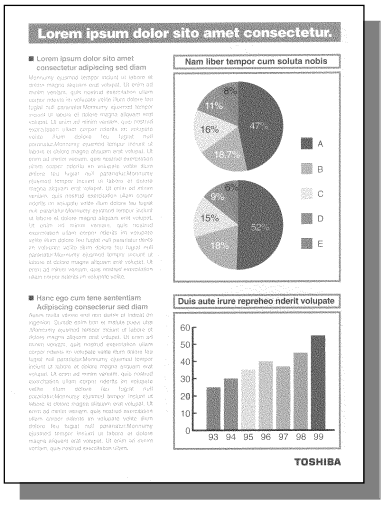
Paper type	Acceptable paper weight	
Thick 1	81 to 105 g/m²	Max. 28 lb. Bond
Thick 2	106 to 163 g/m²	Max. 43 lb. Bond / 90 lb. Index
Thick 3	164 to 209 g/m²	Max. 55 lb. Bond / 110 lb. Index

❑ Cautions after the completion of the adjustment

The adjustment may possibly increase power consumption and slow down the copying or printing speed. Therefore, carefully perform the adjustment, while checking the copy or print image.

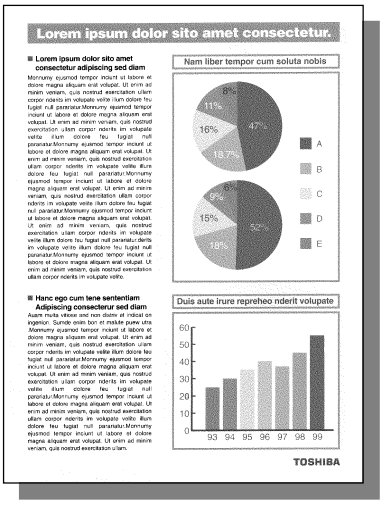
2.1 To Sharply Copy Light Text or Thin Lines

Before the adjustment


Lorem ipsum dolor sito amet consectetur.
Nam liber tempor cum soluta nobis
Duis aute irure repreheo nderit volupate
TOSHIBA

When the light print image is copied, text looks blurred.

After the adjustment


Lorem ipsum dolor sito amet consectetur.
Nam liber tempor cum soluta nobis
Duis aute irure repreheo nderit volupate
TOSHIBA

The graphics image and text look darker and sharper.

❑ Explanation

Perform an adjustment regarding the image processing, in order to obtain a sharp and dark copy image, when copying an original containing light text and graphic images.

❑ Procedures

* Perform the adjustment in accordance with the procedures below.
* Procedure (1) is used by the service technician, and by the user.
* Procedures (2) to (4) are used by the service technician only.

(1) Press the [IMAGE] button on the Control Panel. Press the [SHARPNESS] button.
Press the [SHARP] button to increase the sharpness intensity.

After increasing the sharpness intensity, copy and check the copy image quality.
If moiré occurs on the copy, the service technician must use any combination of procedures listed below.

<Hint> "Minimizing moiré" and "Sharpening the copy image" are mutually contradictory. When an adjustment is performed to sharpen the copy image, moiré may occur. While maintaining the best balance among procedures (2) to (4), perform the adjustment, in order to pursue both sharper copy image and reduction in moiré.

(2) Enter adjustment mode [05]. Increase the value for code [653] to increase the copy density of text.
(To improve faint, smudged text or thin lines)

For e-STUDIO350/450

• First, change the value for code 05-653 in the neighborhood of "220." Next, copy and check the copy image quality. Then finely adjust the value, in accordance with the original density. Up to 255 can be set for this code.

Original mode	[05] code	Value recommended	Acceptable value range	Default
Text/Photo	05-653	Approx. 220	0 to 255	208

For e-STUDIO200L/230/230L/280/280S

• First, change the value for code 05-653 in the neighborhood of "220." Next, copy and check the copy image quality. Then finely adjust the value, in accordance with the original density. Up to 255 can be set for this code.

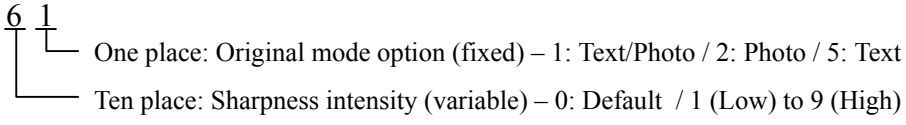
Original mode	[05] code	Value recommended	Acceptable value range	Default
Text/Photo	05-653	Approx. 220	0 to 255	208

After increasing the copy density, copy and check the copy image quality.
The service technician must use the next procedure, in order to increase the default sharpness intensity in advance.

(3) Enter adjustment mode [05]. Increase the value for code [620/621/622] to increase the copy density of text.
(To increase the sharpness intensity)

• The code to use varies, according to original mode (Text/Photo, Photo or Text). Adjust the value for the [05] code corresponding to original mode for which you would like to improve the image quality and change the value set in ten place.
(Change the value in ten place to "4" or more in Text/Photo mode, "2" or more in Photo mode, or "5" or more in Text mode. The sharpness intensity will be increased, compared with the one provided by default.)

* Set value (Ex.: The sharpness intensity in Text/Photo mode (code 05-620) is "6.")


6 1
One place: Original mode option (fixed) – 1: Text/Photo / 2: Photo / 5: Text
Ten place: Sharpness intensity (variable) – 0: Default / 1 (Low) to 9 (High)

For e-STUDIO350/450

Original mode	[05] code	Value recommended	Default
Text/Photo	05-620	61	01
Photo	05-621	42	02
Text	05-622	75	45

For e-STUDIO200L/230/230L/280/280S

Original mode	[05] code	Value recommended	Default
Text/Photo	05-620	61	01
Photo	05-621	42	02
Text	05-622	75	45

* After setting the recommended value, copy and check the copy image quality. If the sharpness adjustment is more effective than required, decrease the value. If the effect of the adjustment is not sufficient, increase the value.

* With "0" set in ten place, the following sharpness intensity is provided as the default value in each original mode except for Text mode:
  - "0" set in Text/Photo mode: Provides almost the same sharpness intensity as the one provided when "3" is set.
  - "0" set in Photo mode: Provides almost the same sharpness intensity as the one provided when "1" is set.
  - "0" set in Text mode: Provides exactly the same sharpness intensity as the one provided when "4" is set.

<Note> With the sharpness intensity set to "9" in ten place, the sharpness intensity will be maximized. Therefore, even if the sharpness level is increased in the sharpness setting under the "IMAGE" menu on the Control Panel, no change will be made in the image quality. At a user's request, leave the default value set for this code, in order to allow the user to maximize the sharpness intensity by moving the "Sharpness" indicator to the "Sharp" side.

After increasing the sharpness intensity, copy and check the copy image quality.
If further image quality adjustments are still necessary, use the next procedure.

(4) Enter setting mode [08]. Change the value for code [550] to switch the default original mode at power-on from "TEXT/PHOTO" to either "TEXT" or "CUSTOM."

- Change the value for code 08-550 to "2" or "3."

Value for 08-550	Default original mode at power-on
0	Text/Photo (default)
1	Photo
2	Text
3	Custom

* Custom mode can be selected, if it has already been enabled using code 08-508. To use Custom mode, the image quality in Custom mode needs to be programmed beforehand, in order to obtain the image quality the user desires. For further information regarding the Custom mode setting, refer to 2.7 To Program Frequently Used Copy Settings.

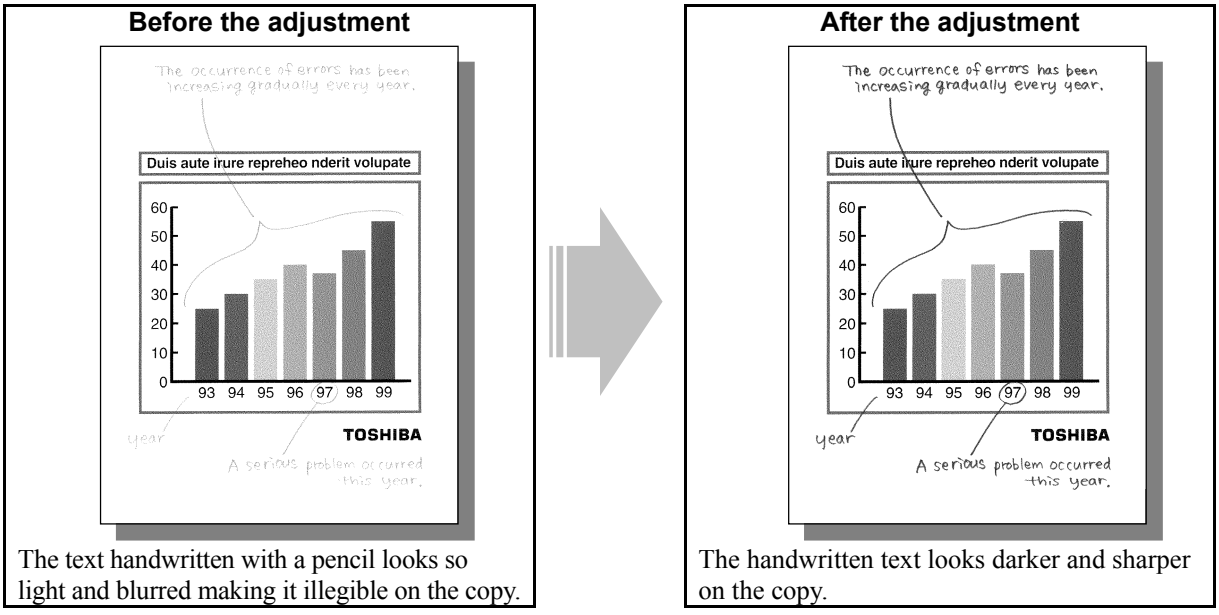
❑ Cautions after the completion of the adjustment

The adjustment may possibly cause an increase in the amount of toner used, moiré, blurred text (small, dark text blurred), diminished photo images or gradational images (less accurate reproduction of halftones). Therefore, carefully perform the adjustment, while checking the copy image.

❑ Remarks

Enter the value within the recommended value range mentioned in the procedures. Otherwise, it may cause a loss in copier performance, including degradation in the image quality and reduction in the life of the consumables.

2.2 To Copy Handwritten Text More Sharply and Darkly



The text handwritten with a pencil looks so light and blurred making it illegible on the copy.

The handwritten text looks darker and sharper on the copy.

❑ Explanation

When an original containing text handwritten with a pencil is copied, the handwritten text may become so light and blurred, making it sometimes illegible on the copy. Perform the adjustment regarding the image processing (sharpness intensity), in order to obtain a darker and sharper handwritten text on the copy.

❑ Procedures

* Perform the adjustment in accordance with the procedures below.
* Procedure (1) is used by the service technician, and by the user.
* Procedure (2) is used by the service technician only.

(1) Press the [IMAGE] button on the Control Panel. Press the [SHARPNESS] button.
Press the [SHARP] button to increase the sharpness intensity.

After increasing the sharpness intensity, copy and check the copy image quality.
The service technician must use the next procedure, in order to increase the default sharpness intensity in advance.

(2) Enter adjustment mode [05]. Increase the value for code [620/621/622] to increase the copy density of text.
(To increase the sharpness intensity)
- The code to use varies, according to original mode (Text/Photo, Photo or Text). Adjust the value for the [05] code corresponding to original mode for which you would like to improve the image quality and change the value set in ten place.
(Change the value in ten place to "4" or more in Text/Photo mode, "2" or more in Photo mode, or "5" or more in Text mode. The sharpness intensity will be increased, compared with the one provided by default.)

* Set value (Ex.: The sharpness intensity in Text/Photo mode (code 05-620) is "6.")

6 1
- One place: Original mode option (fixed) – 1: Text/Photo / 2: Photo / 5: Text
- Ten place: Sharpness intensity (variable) – 0: Default / 1 (Low) to 9 (High)

For e-STUDIO350/450

Original mode	[05] code	Value recommended	Default
Text/Photo	05-620	61	01
Photo	05-621	42	02
Text	05-622	75	45

For e-STUDIO200L/230/230L/280/280S

Original mode	[05] code	Value recommended	Default
Text/Photo	05-620	61	01
Photo	05-621	42	02
Text	05-622	75	45

* After setting the recommended value, copy and check the copy image quality. If the sharpness adjustment is more effective than required, decrease the value. If the effect of the adjustment is not sufficient, increase the value.

* With "0" set in ten place, the following sharpness intensity is provided as the default value in each original mode except for Text mode:
  - "0" set in Text/Photo mode: Provides almost the same sharpness intensity as the one provided when "3" is set.
  - "0" set in Photo mode: Provides almost the same sharpness intensity as the one provided when "1" is set.
  - "0" set in Text mode: Provides exactly the same sharpness intensity as the one provided when "4" is set.

<Note> With the sharpness intensity set to "9" in ten place, the sharpness intensity will be maximized. Therefore, even if the sharpness level is increased in the sharpness setting under the "IMAGE" menu on the Control Panel, no change will be made in the image quality. At a user's request, leave the default value set for this code, in order to allow the user to maximize the sharpness intensity by moving the "Sharpness" indicator to the "Sharp" side.

❑ Cautions after the completion of the adjustment

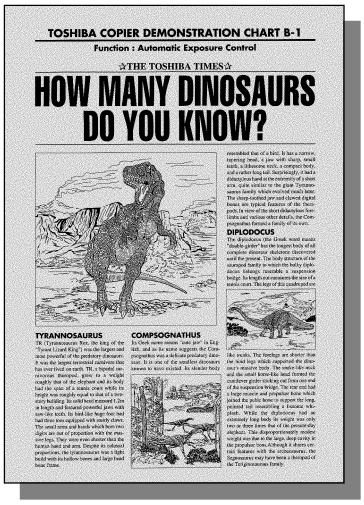
The adjustment may possibly cause moiré. Therefore, carefully perform the adjustment, while checking the copy image.

❑ Remarks

Enter the value within the recommended value range mentioned in the procedures. Otherwise, it may cause a loss in copier performance, including degradation in the image quality.

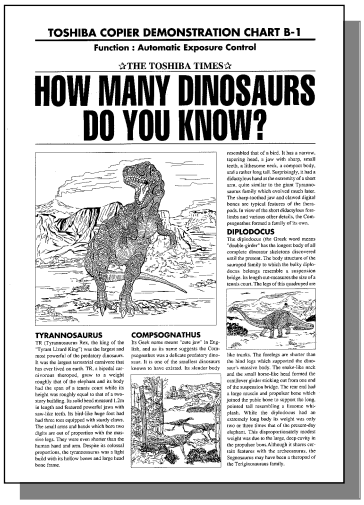
2.3 To Eliminate the Background Color

Before the adjustment



The background color of the original is also copied. Therefore, no clear contrast is made between the background and text.

After the adjustment



The background color is eliminated, allowing clear contrast between the background and text.

❑ Explanation

When black-and white text on a color paper is copied, its background color is also copied. Therefore, no clear contrast is made between the background and text on the copy. Perform the background adjustment, in order to copy the original with the highly colored background, while eliminating the background color or making it white.

❑ Procedures

* Perform the adjustment in accordance with the procedures below.
* Procedure (1) is used by the service technician, and by the user.
* Procedure (2) is used by the service technician only.

(1) Press the [IMAGE] button on the Control Panel. Press the [BACKGROUND ADJUSTMENT] button. Press the [LIGHT] button to decrease the background density.

After decreasing the background density, copy and check the image quality.
The service technician must use the next procedure, in order to increase the default sharpness intensity in advance.

(2) Enter adjustment mode [05]. Increase the value for code [593/594/595] to decrease the background density on the copy. (To adjust the reference value for the background density adjustment and make the copy image become lighter)

• The code to use varies, according to original mode (Text/Photo, Photo or Text). Adjust the value for the [05] code corresponding to original mode for which you would like to improve the image quality and change the value set in ten place.
(Change the value in ten place to "6" or more in all original modes. The background density will be decreased, compared with the one provided by default.)

* Set value (Ex.: The reference value for the background density adjustment is "7.")

7 0

One place: It is not used for the background density adjustment. Therefore, do not change the current value (default: 0).

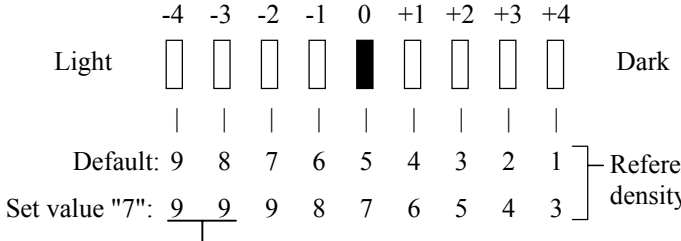
Ten place: Selection of the reference value for the background density adjustment (variable)
– 0: Default / 1: Dark 9: Light

* Increasing the value in ten place will make the copy image become lighter. On the other hand, decreasing the value will make the copy image become darker. With the default value "0" set, the same background density as when "5" is set will be provided.

Original mode	[05] code	Value recommended	Default
Text/Photo	05-593	70, 80, 90	00
Photo	05-594	70, 80, 90	00
Text	05-595	70, 80, 90	00

* After setting the recommended value, copy and check the copy image quality. If the background density is still higher than required, increase the value in ten place. If the background density is too low, decrease the value.

<Note> Changing the value set in ten place will change the background density, when the "Background" indicator in the "IMAGE" menu is set to the center. If the background density of the center value is changed, each step of the indicator will be changed accordingly. If any value other than "0" and "5" is set in ten place, the reference value of the center value will be changed. As a result, moving the indicator, as illustrated below, may not change the background density.


-4 -3 -2 -1 0 +1 +2 +3 +4
Light
Dark
Default: 9 8 7 6 5 4 3 2 1
Set value "7": 9 9 9 8 7 6 5 4 3
Reference value for the background density adjustment set to each step

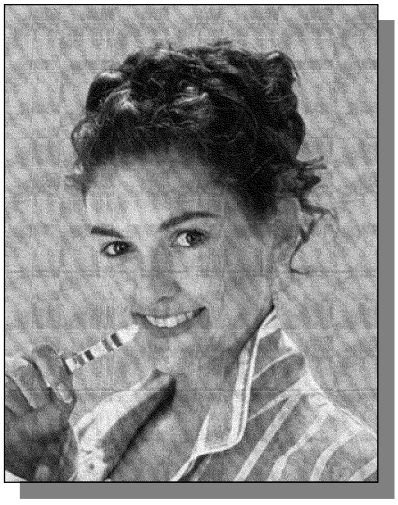
If "7" is set to the center value as the reference value for the background density adjustment, the minimum background density will be set at a few steps before the minimum point of the indicator (steps from -2 to -4, as illustrated above). As a result, the background density can no longer be decreased, even if the indicator is moved to the furthest "light" side.

❑ Cautions after the completion of the adjustment

The adjustment may possibly cause text handwritten with a pencil or light text to become illegible on the copy. Therefore, carefully perform the adjustment, while checking the copy image.

2.4 To Eliminate Moiré

Before the adjustment



Moiré occurs on the photo image.

After the adjustment

Moiré is eliminated and a clear copy image is obtained.

❑ Explanation

When an original containing photo images or gradational images (halftones) is copied, moiré sometimes occurs on the copy. Perform an adjustment regarding the image processing (sharpness intensity), in order to obtain a clear copy image, while eliminating moiré.

❑ Procedures

* Perform the adjustment in accordance with the procedures below.
* Procedures (1), (3) and (4) are used by the service technician, and by the user.
* Procedure (2) is used by the service technician only.

(1) Press the [IMAGE] button on the Control Panel. Press the [SHARPNESS] button.
Press the [SOFT] button to soften the copy image.

After softening the copy image, copy and check the copy image quality.
With the sharpness intensity set to the minimum (softest), if further image quality adjustments are still necessary, the service technician must use the next procedure.

(2) Enter setting mode [08]. Change the value for code [502] to "0" to switch the gradation processing method from "Dither" to "Error diffusion."

Value for 08-502	Gradation processing method
0	Error diffusion
1	Dither (default)

* The advantage of each gradation processing method is as follows:
  - Error diffusion: Attaches importance to minimizing moiré and reproducing text distinctly.
  - Dither: Attaches importance to reproducing clearer and smoother halftones.

After selecting "Error diffusion," use the next procedure.

(3) Press the [BASIC] button on the Control Panel and select "PHOTO" from among the original mode options:

* To have "PHOTO" selected from among the original options by default, use the following procedures:

To change default original mode on the Control Panel

• Use steps (a) to (d) to change default original mode.

(a) Press the [USER FUNCTIONS] button on the Control Panel to enter the "User Functions" menu.

(b) Press the [USER] button.

(c) Press the [COPY] button.

(d) In the "ORIGINAL MODE" option, press the [PHOTO] button.

To change default original mode in setting mode [08]

• Enter setting mode [08]. Change the value for code [550] to switch the original mode option from "TEXT/PHOTO" to "PHOTO."

• Change the value for code 08-550 to "1."

Value for 08-550	Default original mode at power-on
0	Text/Photo (default)
1	Photo
2	Text
3	Custom

* Custom mode can be selected, if it has already been enabled using code 08-508. For further information regarding the Custom mode setting, refer to 2.7 To Program Frequently Used Copy Settings.

After selecting Photo mode, copy and check the copy image quality.
If further image quality adjustments are still necessary, use the next procedure.

(4) With "PHOTO" selected from among the original mode options, press the [IMAGE] button on the Control Panel. Press the [SHARPNESS] button. Press the [SOFT] button to soften the copy image.

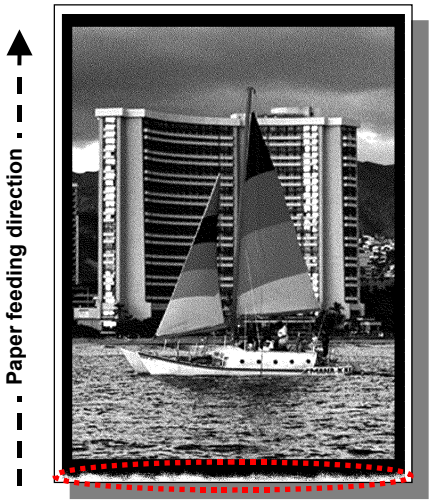
❑ Cautions after the completion of the adjustment

The adjustment may possibly cause the image to be generally blurred (decreased resolving power). Therefore, carefully perform the adjustment, while checking the copy image.

2.5 To Clearly Copy at the Trailing Edge of the Paper in Duplex Copying

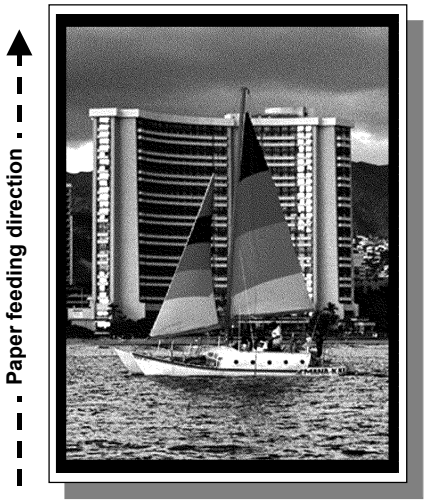
(To adjust the bottom margin on the back of the page in duplex copying)

Before the adjustment



In duplex mode, the bottom margin on the back of the page is narrow. This makes the image at the trailing edge of the paper become less clear.

After the adjustment



The bottom margin on the back of the page is properly increased. This makes the image at the trailing edge of the paper become clearer.

❑ Explanation

In duplex copying, the bottom margin (margin at the trailing edge of the paper) on the back of the paper (or printed side delivered facing downwards) may be narrower than on the front (or printed side delivered facing upwards) in simplex or duplex copying, depending on the paper size and how much paper is moistened. This results in the faint image at the trailing edge on the back of the paper. Adjust the bottom margin, in order to clearly copy at the trailing edge on the back of the paper.

* This adjustment will have an effect only on the image printed on the back of the paper in duplex copying. Remember that it will not affect the image printed in simplex copying, or the one printed on the front of the paper in duplex copying.

❑ Procedures

* The service technician must perform the adjustment in accordance with the procedures below.

(1) With the platen cover or RADF opened, make a double-sided copy. (Copy a solid black image.)

• Checking the copy image, determine how much the bottom margin should be increased.

* Select the best paper size for duplex copying, if necessary. It is recommended to use the paper, which is most frequently used for duplex copying.

* When making a double-sided copy of the solid black image, place blank paper on the original glass, allowing the solid black image to be copied only at the trailing edge on the back of the paper, for toner saving purposes.

(2) Enter adjustment mode [05]. Change the value for subcode "0" of code [434] to adjust the bottom margin on the back of the paper.

• The amount of change per step varies, depending on the paper size.
  • Long size (A3/B4/LD/LG): The bottom margin will be increased by 0.042 mm per step.
  • Short size (A4/LT): The bottom margin will be increased by 0.028 mm per step.
  • Middle size (A4-R/LT-R, etc.): The bottom margin determined for the short size will be applied.

For e-STUDIO350/450

[05] code	Subcode	Value recommended	Acceptable value range	Default
05-434	0	Set a value larger than the current one to increase the bottom margin.	0 to 255	UC: 24 EUR: 48 Others: 48

For e-STUDIO200L/230/230L/280/280S

[05] code	Subcode	Value recommended	Acceptable value range	Default
05-434	0	Set a value larger than the current one to increase the bottom margin.	0 to 255	29

* Set the value in increments of approximately 12, while checking the copy image until the optimum value is obtained.

* Set "0" for the subcode. Setting "1" for the subcode allows you to adjust the right margin on the back in duplex copying, but it is not necessary here. Therefore, never change the value for subcode 1.

• After the adjustment, make a double-sided copy again, with the platen cover or RADF opened and check the image at the trailing edge on the back of the paper. If further image quality adjustments are still necessary, repeat step (2).

<Hint> If the user is concerned regarding the image quality at the trailing edge on the back of the paper, set a slightly wider bottom margin (3 to 4 mm). If not, it is recommended to set it to 2 to 3 mm.

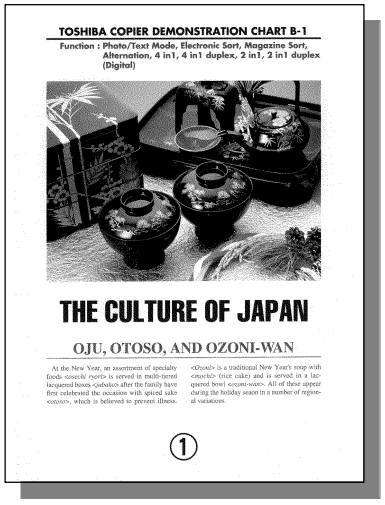
❑ Cautions after the completion of the adjustment

Nothing in particular.

2.6 To Adjust Reproducibility to Uses in Photo Mode

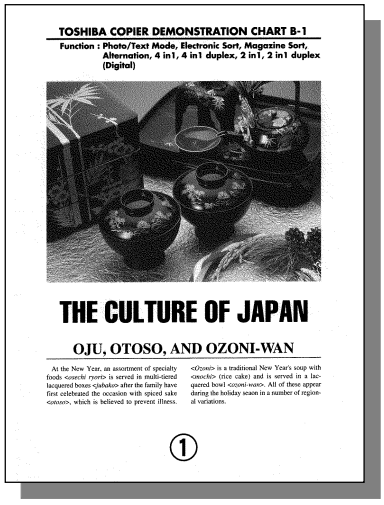
(To attach importance to halftone reproducibility, text reproducibility or reduction in moiré)

Dither-processed


TOSHIBA COPIER DEMONSTRATION CHART B-1
Function : Photo/Text Mode, Electronic Sort, Magazine Sort, Alternation, 4 in1, 4 in1 duplex, 2 in1, 2 in1 duplex (Digital)
THE CULTURE OF JAPAN
OJU, OTOSO, AND OZONI-WAN
①

A copy is made to reproduce halftones (photo area) more clearly.

Error diffusion-processed


TOSHIBA COPIER DEMONSTRATION CHART B-1
Function : Photo/Text Mode, Electronic Sort, Magazine Sort, Alternation, 4 in1, 4 in1 duplex, 2 in1, 2 in1 duplex (Digital)
THE CULTURE OF JAPAN
OJU, OTOSO, AND OZONI-WAN
①

A copy is made to reproduce text distinctly and minimize moiré.

❑ Explanation

The following two gradation processing methods for photo mode (reproducing halftones with binary data) are available: "Dither" attaching greater importance to reproducibility of photos and gradations and "Error diffusion processing" attaching greater importance to text reproducibility and reduction in moiré. By selecting either of these methods effectively, the image quality in photo mode can be adjusted in accordance with the users' preferences and the uses of the copy image.

❑ Procedure

*The adjustment is performed by the service technician only.

(1) Enter setting mode [08]. Change the value for code [502] to select the gradation processing method in accordance with the users' preferences and the uses of the copy image.

Value for 08-502	Gradation processing method
0	Error diffusion
1	Dither (default)

*The advantage of each gradation processing method is as follows:

- Error diffusion: Attaches importance to minimizing moiré and reproducing text distinctly.
- Dither: Attaches importance to reproducing clearer and smoother halftones.

❑ Cautions after the completion of the adjustment

Nothing in particular.

2.7 To Program Frequently Used Copy Settings

(To use Custom mode)

❑ Explanation

For the e-STUDIO350/450 and the e-STUDIO200L/230/230L/280/280S, three original mode options are available by default: Text/Photo, Text and Photo. In addition, "Custom" mode is available, allowing more specific image quality adjustments, in order to satisfy the users' needs. It is strongly recommended to use Custom mode to program frequently used copy settings for a particular copy job. Custom mode is the most suitable for the user, who often makes special copies or who is not satisfied with the image quality provided by the default original mode options.

* The following three Custom mode options are available: Text/Photo-based, Text-based and Photo-based. Select one. Custom mode can be used, independent of the default original mode options. Therefore, adjusting the value for Custom mode will not affect the default original mode settings (Text/Photo, Text and Photo).

❑ Procedures

* Perform the adjustment in accordance with the procedures below.
* Procedures (1) and (2) are used by the service technician only.
* Procedure (3) is used by the service technician, and by the user.

(1) Enter setting mode [08]. Change the value for code [508] to select one of the default custom mode options.

• Select the custom mode option, which is based on the default original mode option most suitable for the image quality the user desires. Remember that the item, which can be adjusted, varies, depending on the selected custom mode option. (Refer to "Remarks" in the table below.)

Value for 08-508	Custom mode option	Remarks
0	Not used	---
1	Custom mode 1 (based on Text/Photo mode)	Code 05-928 (adjustment of smudged/faint text) can be used.
2	Custom mode 2 (based on Text mode)	---
3	Custom mode 3 (based on Photo mode)	Code 08-509 (selection of the gradation processing method) can be used.

* Setting any value from "1" to "3" for code 08-508 will enable Custom mode and allow the user to select it as one of the original mode options on the Control Panel. Immediately after Custom mode is enabled, the default values for the default original mode option, which Custom mode is based on, will be applied. For instance, if "2" is set for code 08-508, Custom mode 2 will be enabled. All the factory-shipped values (default values) for Text mode will be applied in Custom mode 2 without being changed.

After selecting the Custom mode option, use the next procedure.

(2) Enter adjustment mode [05]. Adjust the set values of the adjustment items in order to satisfy the users' needs for the image quality.

• Use any of the following procedures, as necessary:

* The code to use varies, depending on the selected Custom mode option (Custom mode 1, 2 or 3). Refer to the table in each procedure below and adjust the value corresponding to the selected Custom mode option.

To adjust the copy density

(a) Enter adjustment mode [05]. Change the value for code [931/932/933] or [940/941/942] to adjust the copy density. Increase the value to obtain a darker copy image. Decrease the value to obtain lighter copy image.

Custom mode option	Copy density mode	[05] code	Value recommended	Acceptable value range	Default
Custom mode 1 (based on Text/Photo mode)	Automatic	05-940	Current value ± 30	0 to 255	128
	Manual	05-931			
Custom mode 2 (based on Text mode)	Automatic	05-941	Current value ± 30	0 to 255	128
	Manual	05-932			
Custom mode 3 (based on Photo mode)	Automatic	05-942	Current value ± 30	0 to 255	128
	Manual	05-933			

<Note> If a value set for manual copy density mode is too large or small, the maximum or minimum copy density may be set at a few steps before the maximum or minimum point of the indicator. As a result, the copy density can no longer be changed, even if the "Density" indicator on the Control Panel is moved to the furthest "Dark" or "Light" side.

To adjust the amount of change in the "Density" indicator

(a) Enter adjustment mode [05]. Change the values for codes [934 to 939] to adjust the amount of change in the density per step of the indicator in manual copy density mode. As the value is increased, the amount of change per step will also be increased. As the value is decreased, the amount of change per step will also be decreased.

Custom mode option	Indicator moving direction	[05] code	Value recommended	Acceptable value range	Default
Custom mode 1	Light step	05-934	Current value ± 20	0 to 255	20
	Dark step	05-937			
Custom mode 2	Light step	05-935	Current value ± 20	0 to 255	20
	Dark step	05-938			
Custom mode 3	Light step	05-936	Current value ± 20	0 to 255	20
	Dark step	05-939			

* Light step: Moving the indicator to the [◁] side.
Dark step: Moving the indicator to the [▷] side.

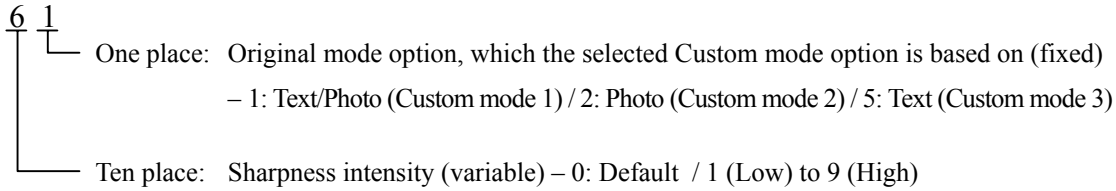
<Note> If a value set for manual copy density mode is too large or small, the maximum or minimum copy density may be set at a few steps before the maximum or minimum point of the indicator. As a result, the copy density can no longer be changed, even if the "Density" indicator on the Control Panel is moved to the furthest "Dark" or "Light" side.

To increase the sharpness intensity (to copy light text or thin lines more clearly)

* This adjustment will be effective, if an original containing light text, thin lines or graphic images need to be copied clearly.

(a) Enter adjustment mode [05]. Increase the value set in ten place for code [922/923/924] to increase the sharpness intensity.

* Set value (Ex.: The sharpness intensity in Custom mode 1 (code 05-922) is "6.")


6 1
One place: Original mode option, which the selected Custom mode option is based on (fixed)
– 1: Text/Photo (Custom mode 1) / 2: Photo (Custom mode 2) / 5: Text (Custom mode 3)
Ten place: Sharpness intensity (variable) – 0: Default / 1 (Low) to 9 (High)

Custom mode option	[05] code	Value recommended	Default
Custom mode 1	05-922	61	01
Custom mode 2	05-923	75	45
Custom mode 3	05-924	42	02

<Note> • Setting too large a value for this code may cause moiré.

• Refer to procedure (2) in 2.2 To Copy Handwritten Text More Sharply and Darkly for further information regarding the sharpness adjustment procedure.

To copy text or lines more clearly

(a) Enter adjustment mode [05]. Increase the value for code [928] to increase the copy density of text or lines. (To improve faint, smudged text or thin lines)

Custom mode option	[05] code	Value recommended	Acceptable value range	Default
Custom mode 1	05-928	220 to 255	0 to 255	208

<Note> Setting too large a value for this code may shorten the life of the consumables.

To copy while eliminating the background color (to adjust the reference value for the background density adjustment)

* This adjustment will be effective, in order to copy the original, while eliminating the background color.

(a) Enter adjustment mode [05]. Increase the value set in ten place for code [943/944/945] to decrease the background density on the copy. (To adjust the reference value for the background density adjustment and make the copy image become lighter)

* Set value (Ex.: The reference value for the background density adjustment is "7.")

7 0

One place: It is not used for the background density adjustment. Therefore, do not change the current value (default: 0).

Ten place: Selection of the reference value for the background density adjustment (variable)
– 0: Default / 1: Dark 9: Light

Custom mode option	[05] code	Value recommended	Default
Custom mode 1	05-943	70, 80, 90	00
Custom mode 2	05-944	70, 80, 90	00
Custom mode 3	05-945	70, 80, 90	00

<Note> • Setting too large a value for this code may prevent light text or thin lines from being copied clearly.

• Refer to procedure (2) in 2.3 To Eliminate the Background Color for further information regarding the background density adjustment.

To copy while eliminating the background color (to adjust range correction)

* This adjustment will be effective, in order to copy the original, while eliminating the background color.

• Use steps (a) to (b) to adjust the background peak of range correction and make the copy image look white (light).

(a) Enter adjustment mode [05]. Change the values for codes [913 to 918] to set the background peak of range correction to "fixed."

• The code to use varies, according to the density option (auto or manual) and use of the RADF (MR-3015). Adjust the value for the [05] code corresponding to the condition for which you would like to improve the image quality and set "1" in one or ten place.

* Set value (Ex.: To set the background/text peak in manual and auto copy density mode to "fixed")

1 1

One place: Set the background/text peak in auto copy density mode to "fixed"
– See the table below for further information.

Ten place: Set the background/text peak in manual copy density mode to "fixed"
– See the table below for further information.

Value	Background peak	Text peak
1	Fixed	Fixed
2	Varied	Fixed
3	Fixed	Varied
4	Varied	Varied

To scan an original manually placed on the original glass

Custom mode option	[05] code	Copy density mode	Value recommended		Default	
			Ten place	One place	Ten place	One place
Custom mode 1	05-913	Manual	1	Current value	1	2
		Automatic	Current value	1		
Custom mode 2	05-914	Manual	1	Current value	2	2
		Automatic	Current value	1		
Custom mode 3	05-915	Manual	1	Current value	1	2
		Automatic	Current value	1		

To scan an original fed from the RADF

Custom mode option	[05] code	Copy density mode	Value recommended		Default	
			Ten place	One place	Ten place	One place
Custom mode 1	05-916	Manual	1	Current value	1	2
		Automatic	Current value	1		
Custom mode 2	05-917	Manual	1	Current value	2	2
		Automatic	Current value	1		
Custom mode 3	05-918	Manual	1	Current value	1	2
		Automatic	Current value	1		

After adjusting the background density, copy and check the copy image quality.
If further image quality adjustments are still necessary, use the next procedure.

(b) Enter adjustment mode [05]. Increase the value for code [919/920/921] to change the background peak of range correction and make the copy image look white (light). (Increase the number of pixels to be identified as "white" by range correction.)

Custom mode option	[05] code	Value recommended	Acceptable value range	Default
Custom mode 1	05-919	Current value +10 to +30	0 to 255	40
Custom mode 2	05-920	Current value +10 to +30		64
Custom mode 3	05-921	Current value +10 to +30		16

After changing the background peak of range correction, use the next procedure.

(3) Press the [BASIC] button on the Control Panel. Select [CUSTOM] from among the original mode options.
* To have "CUSTOM" selected from among the original mode options by default, refer to procedure (3) in 2.4 To Eliminate Moiré.

❑ Cautions after the completion of the adjustment

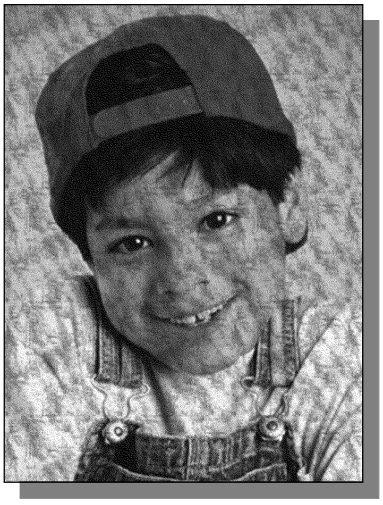
Nothing in particular.

❑ Remarks

Specific examples of how Custom mode is used are explained below.

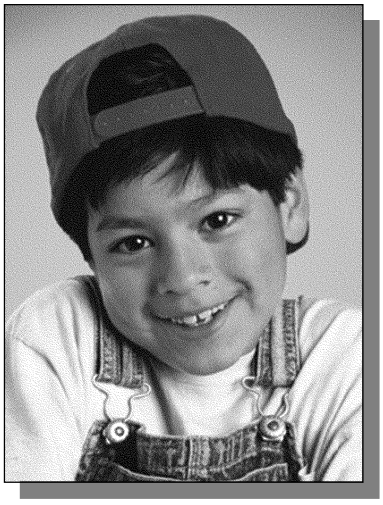
To program copy settings specifically for copying printed photo images, in Custom mode

Before the adjustment



When the printed photo is copied in Photo mode, moiré may occur on the copy.

After the adjustment



The copy settings specifically for copying printed photo images are programmed in Custom mode. This will minimize moiré on the copy.

When a printed photo (a photo with the screen rulings of approximately 100 lpi (lines per inch)) is copied in Photo mode, moiré may occur on the copy image. This is because "Dither" is selected as a gradation processing method by default. In this case, switch the gradation processing method to "Error diffusion" and program it in Custom mode 3, which is based on Photo mode. As a result, the user will be able to use Custom mode 3 specifically for copying printed photos.

(1) Change the value for code 08-508 to "3."

• Select Custom mode 3 (based on Photo mode).

(2) Change the value for code 08-509 to "0."

• Switch the gradation processing method to "Error diffusion."

Value for 08-509	Gradation processing method
0	Error diffusion
1	Dither (default)

* The advantage of each gradation processing method is as follows:

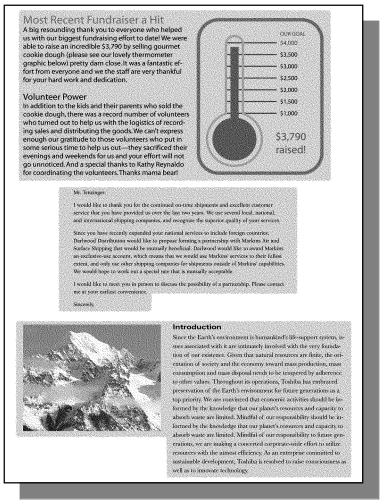
• Error diffusion: Attaches importance to minimizing moiré and reproducing text distinctly.

• Dither: Attaches importance to reproducing clearer and smoother halftones.

(3) Make a copy in Custom mode.

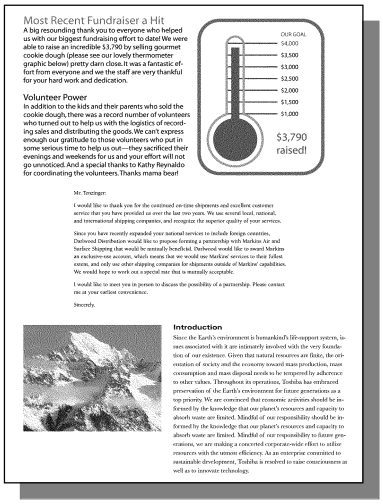
To program copy settings specifically for copying clippings in a scrapbook, in Custom mode

Before the adjustment



When the scrapbook, which newspaper articles are pasted on, is copied, the background color of the clipped newspaper will also be copied.

After the adjustment



The copy settings specifically for copying clippings in a scrapbook are programmed in Custom mode. This will eliminate the background color.

When a scrapbook with clipped newspaper articles pasted on (or any white sheet, on which a clipping in a dark background color is pasted) is copied, the background color of the clipped newspaper article may also be copied. In this case, program the specific copy settings in Custom mode, including the background density and sharpness intensity adjustments, in order to eliminate the background color. As a result, the user will be able to use Custom mode specifically for copying clippings in a scrapbook.

(1) Change the value for code 08-508 to "1."
- Select Custom mode 1 (based on Text/Photo mode).

(2) Increase the value for code 05-943.
- Perform the background density adjustment, in order to decrease the background density. Refer to procedure (2) in To copy while eliminating the background color (to adjust the reference value for the background density adjustment) for further information regarding the adjustment procedures.

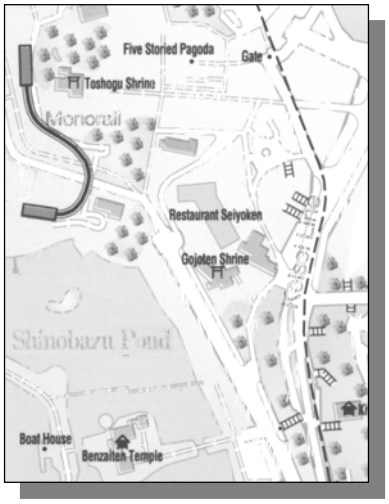
(3) Make a copy in Custom mode.

* If text or thin lines are too light on the copy, increase the value for code 05-922 to increase the sharpness intensity. Refer to procedure (2) in To increase the sharpness intensity for further information regarding the adjustment procedures.

3.1 To Clearly Print Lines or Text

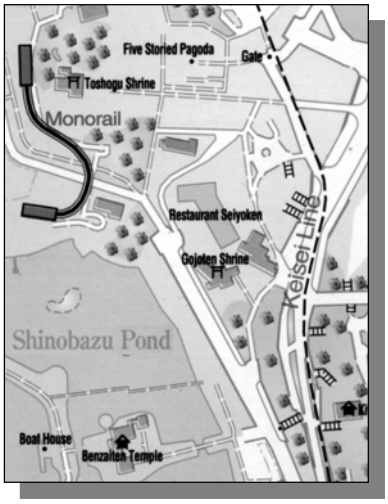
(To adjust density or thickness of lines or text)

Before the adjustment



Light-colored thin lines and text are dotted on the printout.

After the adjustment



The light-colored thin lines and text are clearly printed out.

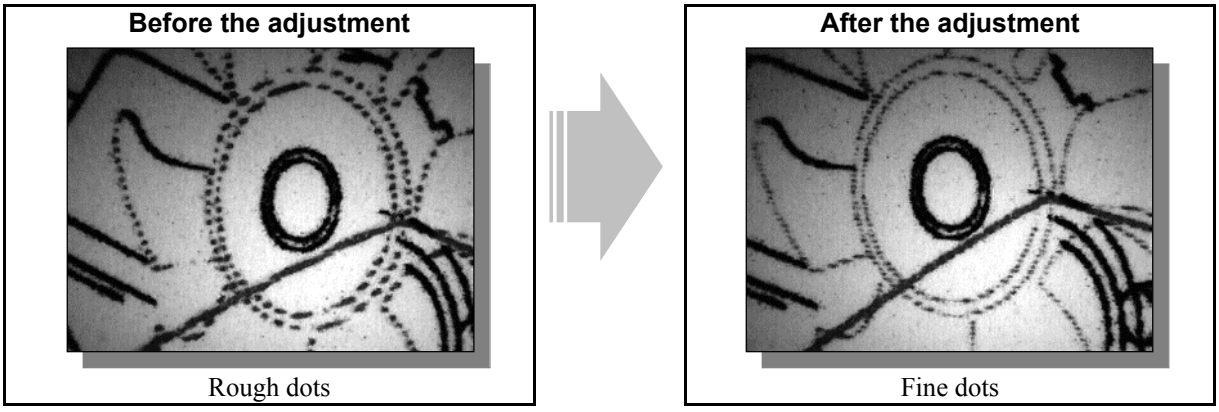
❑ Explanation

When light-colored thin lines or text are printed out, they may sometimes be dotted on the printout. Or, when dark-colored lines or text are printed out, they may sometimes become too thick on the printout. Change "Halftone" and "Toner Save" of the printer driver setting or adjust the toner density level, in order to clearly print them out.

❑ Procedure

* The procedure varies among the following cases: 3.1.1 "To Clearly Print Light-colored Thin Lines or Text (to prevent the lines or text from being dotted)", "3.1.2 To Print Light-colored Lines or Text More Darkly", and "3.1.3 To Print Thinner Lines or Text." Refer to each procedure as necessary.

3.1.1 To Clearly Print Light-colored Thin Lines or Text (To make the dots smaller)



* The adjustment is performed by the service technician, and by the user.

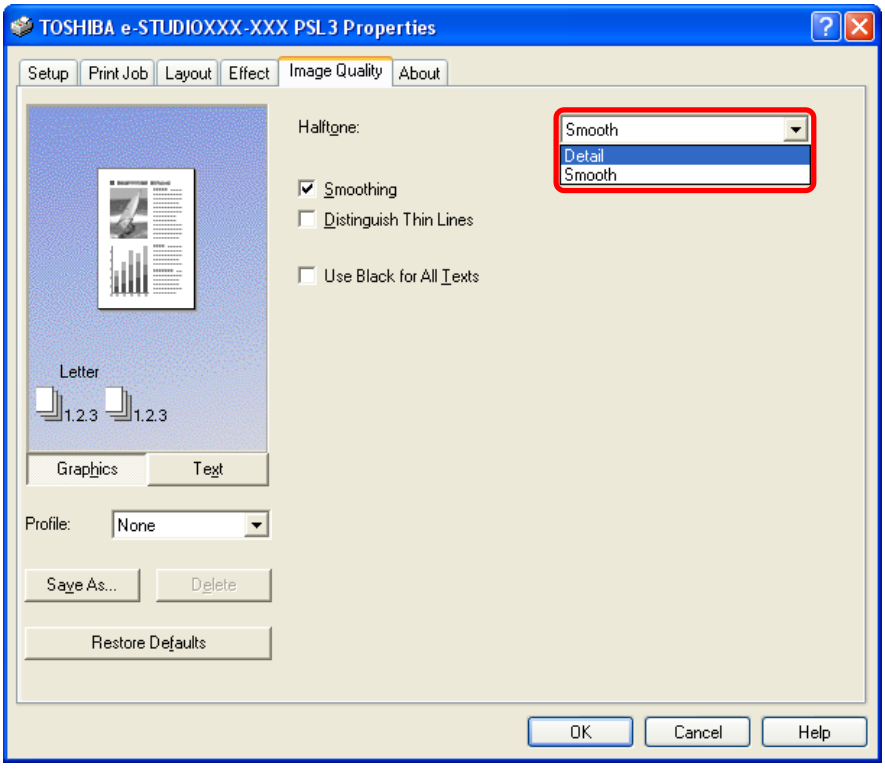
(1) Select "Detail" from among the "Halftone" options on the printer driver.

* This adjustment will have an effect only on printing on the PS3 emulation or Macintosh printer driver. (This adjustment cannot be performed on the PCL6 printer driver.)

For Windows

PS3

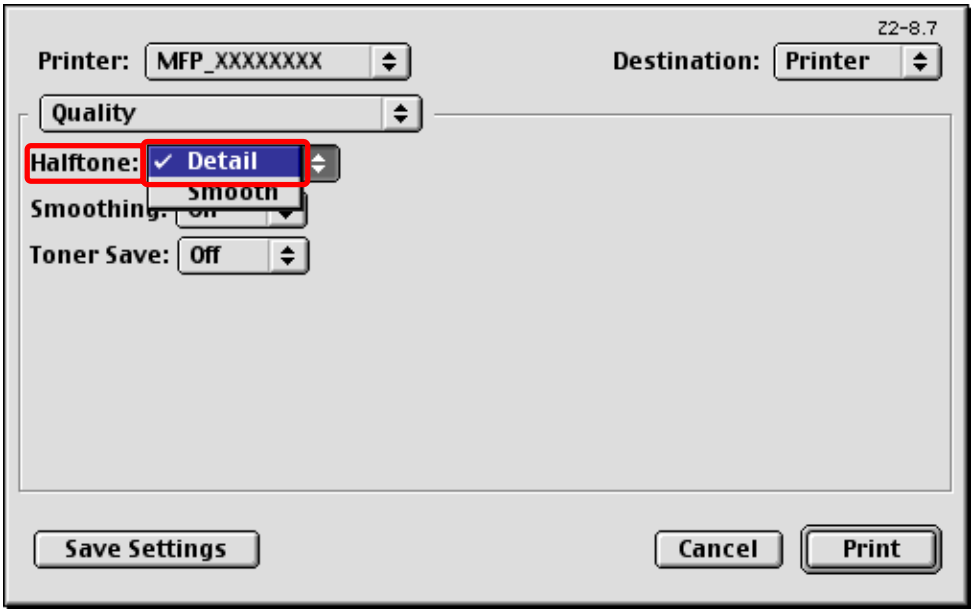
Open the property page of the printer driver. Switch the "Halftone" setting to "Detail" in the Image Quality tab.



For Macintosh

Mac

Open the print settings dialog box. In the "Quality" menu, select "Detail" from among the "Halftone" options.



After changing the printer driver setting, print and check the print image quality.
If further image quality adjustments are still necessary, the service technician must perform the adjustment in accordance with the procedures described in "3.1.2 To Print Light-colored Lines or Text More Darkly".

❑ Cautions after the completion of the adjustment

The adjustment may possibly cause graininess or variations in the print density on the halftones or text areas. Therefore, carefully perform the adjustment, while checking the printout.

3.1.2 To Print Light-colored Lines or Text More Darkly

* The service technician must perform the adjustment in accordance with the procedures below.

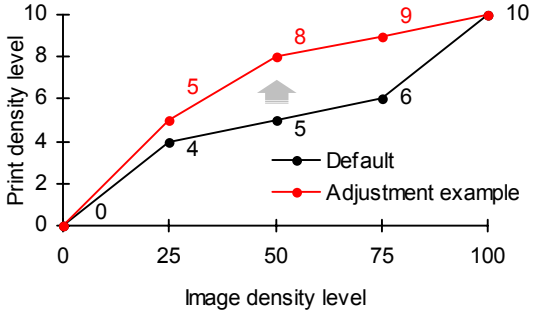
PCL6 PS3 Mac

(1) Enter adjustment mode [05]. Increase the value for code [672] to increase each image density level.

[05] code	Subcode	Value recommended	Default
05-672	0	0 (Fixed)	0
	1	5	4
	2	8	5
	3	9	6
	4	10	10

* The subcode varies, according to the image density level to be adjusted. Refer to the table and the graph below and set the subcode for the image density level to be adjusted. Never change the value for Subcode "0" (image density level "0"), or an image problem may occur.

Subcode	Image density level to be adjusted
0	0
1	25
2	50
3	75
4	100



* Correlation of image density level value among subcode numbers should be that the higher the subcode number is, the higher the image density level value is. If the image density level value for a lower subcode number is greater than that for a higher subcode number, an image quality problem may occur.

Ex.: When the image density level for 672-0, 672-1, 672-2, 672-3, and 672-4 is assumed to be "A0", "A1", "A2", "A3", and "A4" respectively, they should have the following correlation:

$A0 \leq A1 \leq A2 \leq A3 \leq A4$

After adjusting the image density level, print and check the image quality.

❑ Cautions after the completion of the adjustment

Increasing the image density level may possibly cause diminished photo images or gradations (less accurate reproduction of halftones), an increase in the amount of toner consumed, and extremely dark images (decreased resolving power). Therefore, carefully perform the adjustment, while checking the printout.

❑ Remarks

• Enter the value recommended in the procedure for adjustment.

• The effect of the adjustment may vary, depending on the usage pattern of the consumables, such as the developer material and drum, and the operating environment of the copier.

3.1.3 To Print Thinner Lines or Text

* Perform the adjustments in order as listed below.
* Procedures (1) and (2) are used by the service technician, and by the user.
* Procedure (3) is used by the service technician only.

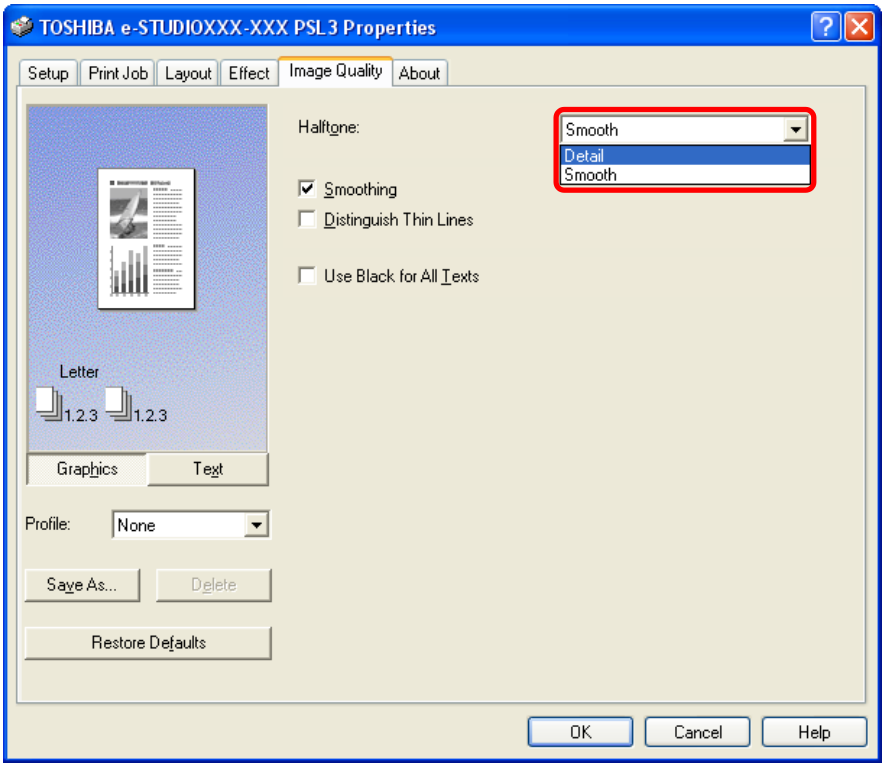
(1) Select "Detail" from among the "Halftone" options on the printer driver.

* This adjustment will have an effect only on printing on the PS3 emulation or Macintosh printer driver. (This adjustment cannot be performed on the PCL6 printer driver.)

For Windows

PS3

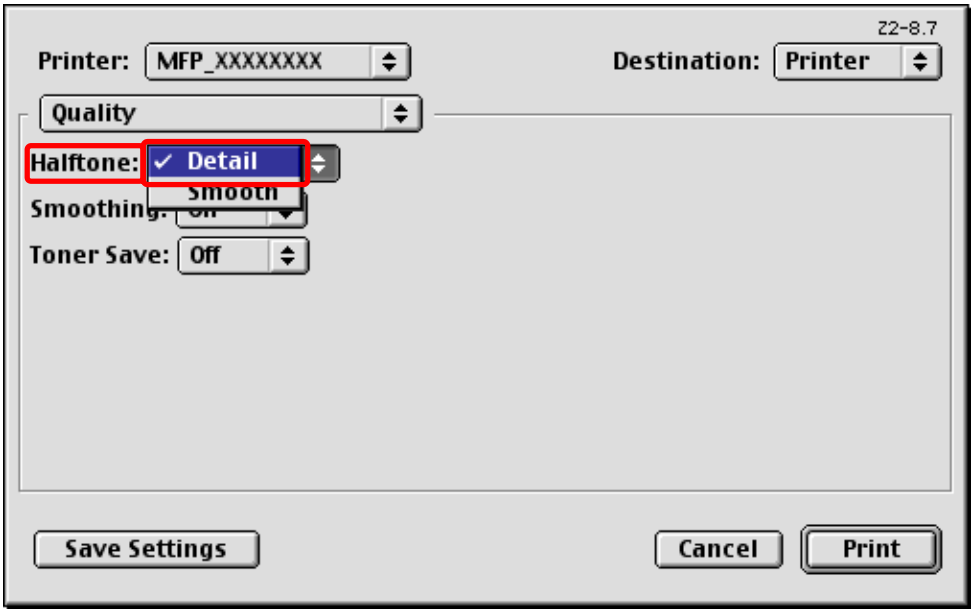
Open the property page of the printer driver. Switch the "Halftone" setting to "Detail" in the Image Quality tab.



For Macintosh

Mac

Open the print settings dialog box. In the "Quality" menu, select "Detail" from among the "Halftone" options.



After changing the printer driver setting, print and check the print image quality.

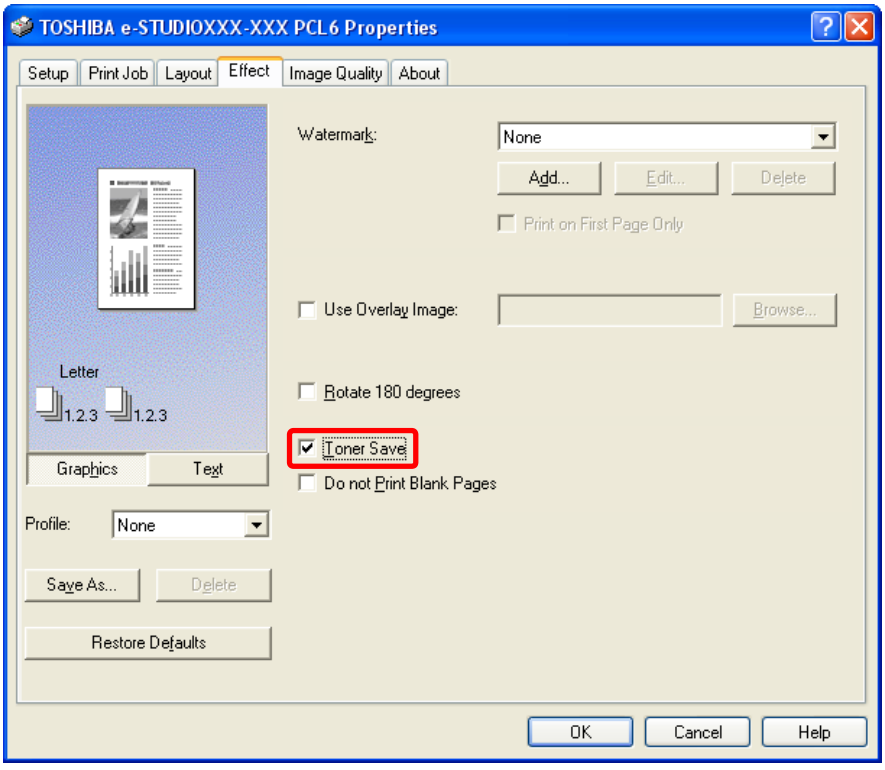
If further image quality adjustments are still necessary, use the next procedure.

(2) Enable toner save mode on the printer driver.

For Windows

PCL6 PS3

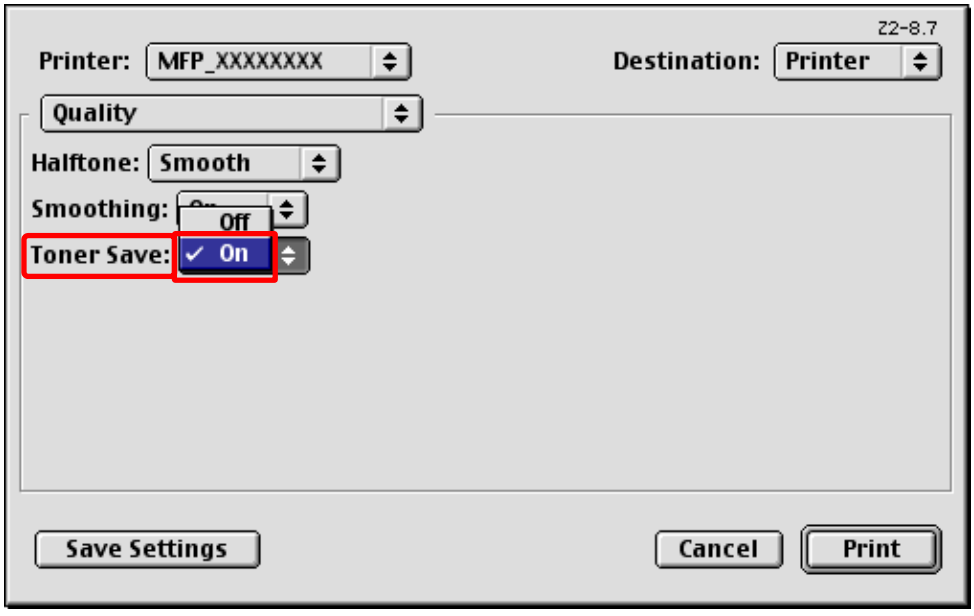
Open the property page of the printer driver. Mark the "Toner Save" checkbox in the "Effect" tab.



For Macintosh

Mac

Open the print settings dialog box. In the "Quality" menu, select the "Toner Save" option to "On."



After changing the printer driver setting, print and check the print image quality.

If further image quality adjustments are still necessary, the service technician must use the next procedure.

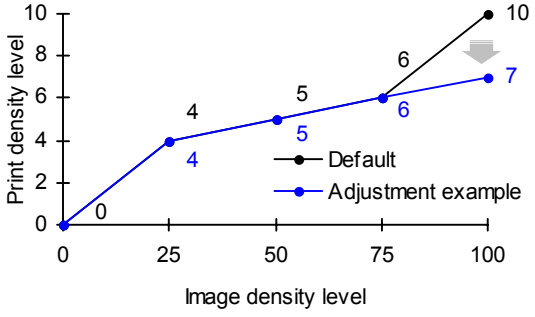
PCL6 PS3 Mac

(3) Enter adjustment mode [05]. Decrease the value for code [672] to decrease each image density level.

[05] code	Subcode	Value recommended	Default
05-672	0	0 (Fixed)	0
	1	4	4
	2	5	5
	3	6	6
	4	7	10

* The subcode varies, according to the image density level to be adjusted. Refer to the table and the graph below and set the subcode for the image density level to be adjusted. Never change the value for Subcode "0" (image density level "0"), or an image problem may occur.

Subcode	Image density level to be adjusted
0	0
1	25
2	50
3	75
4	100



* Correlation of image density level value among subcode numbers should be that the higher the subcode number is, the higher the image density level value is. If the image density level value for a lower subcode number is greater than that for a higher subcode number, an image quality problem may occur.

Ex.: When the image density level for 672-0, 672-1, 672-2, 672-3, and 672-4 is assumed to be "A0", "A1", "A2", "A3", and "A4" respectively, they should have the following correlation:

$A0 \leq A1 \leq A2 \leq A3 \leq A4$

After adjusting the image density level, print and check the print image quality.

❑ Cautions after the completion of the adjustment

The adjustment may possibly cause graininess or variations in the print density on the halftones or text areas, degradation in photo or gradational images (less accurate reproduction of halftones), extremely light images (decreased resolving power), and lower image density in the solid filled area. Therefore, carefully perform the adjustment, while checking the printout.

❑ Remarks

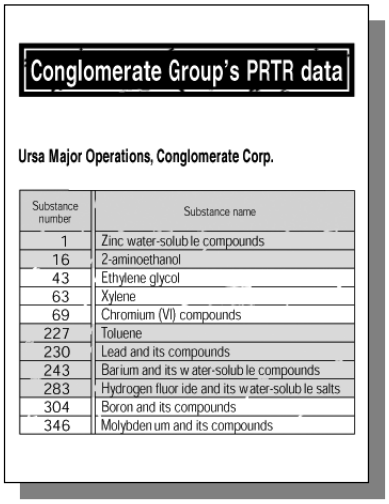
- Enter the value recommended in the procedure for adjustment.

- The effect of the adjustment may vary, depending on the usage pattern of the consumables, such as the developer material and drum, and the operating environment of the copier.

- The image density in toner save mode can also be adjusted. For further information regarding the adjustment procedures, refer to 3.4 To Adjust the Image Density in Toner Save Mode.

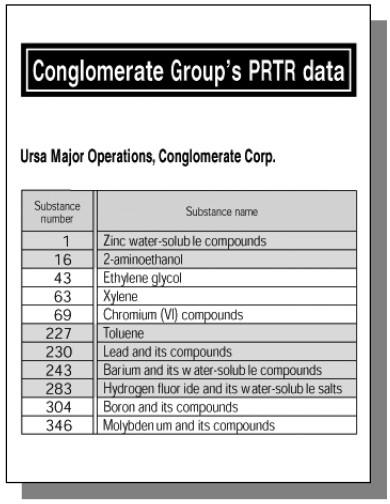
3.2 To Clearly Print the Thin Lines / White Lines on the Black Background

Before the adjustment



The thin lines or the white lines on the black background are dotted on the printout.

After the adjustment



The thin lines or the white lines on the black background are clearly printed out.

❑ Explanation

When the thin lines or the white lines on the black background are printed out, they may sometimes be dotted on the printout. Change the printer driver setting, in order to clearly print them out.

❑ Procedure

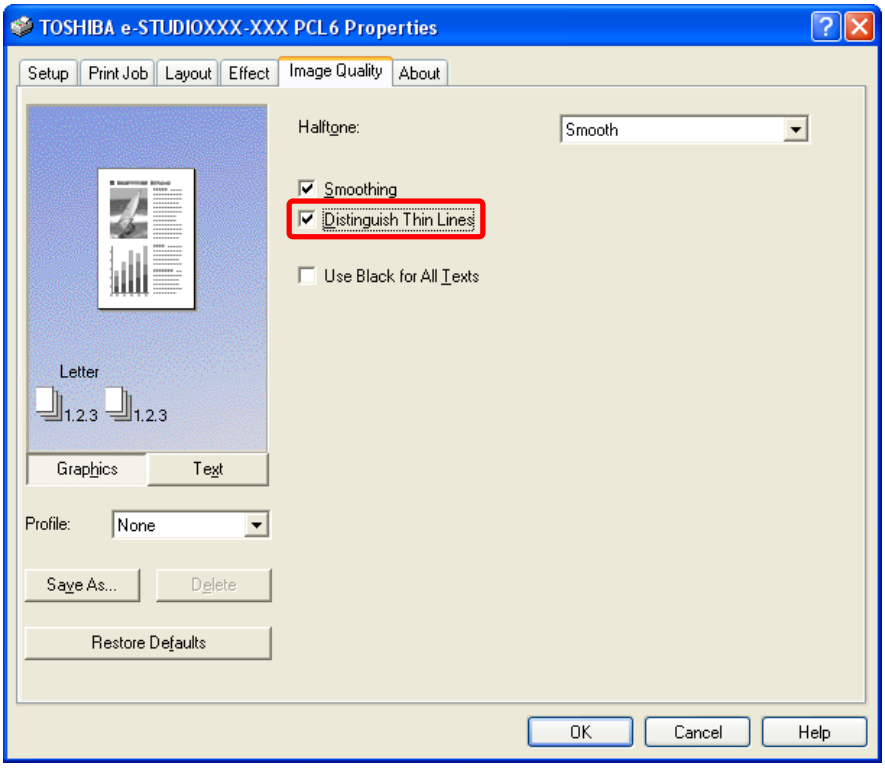
* The adjustment is performed by the service technician, and by the user.

(1) Mark the "Distinguish Thin Line" checkbox on the printer driver.

For Windows

PCL6 PS3

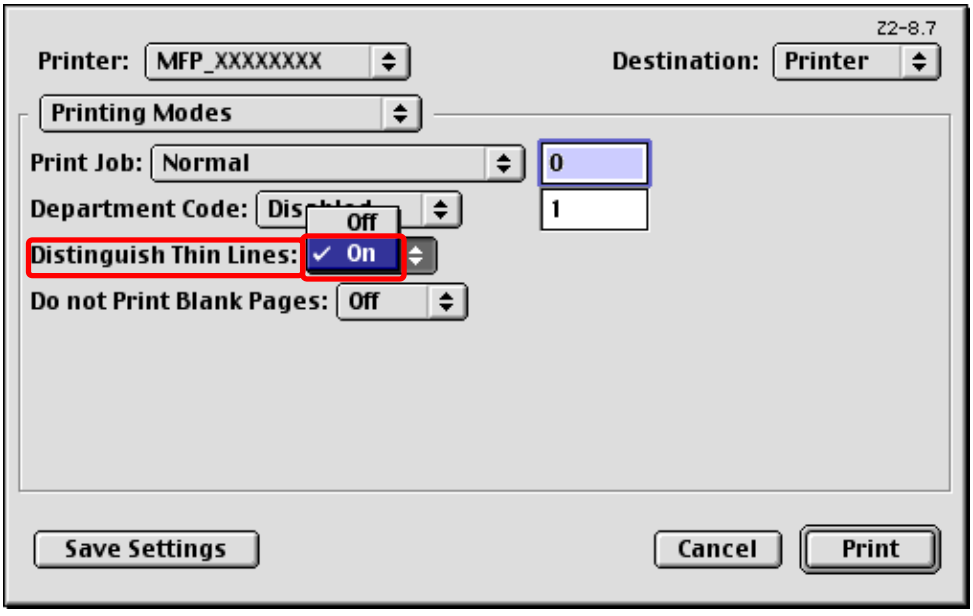
Open the property page of the printer driver. Mark the "Distinguish Thin Lines" checkbox in the "Image Quality" tab.



For Macintosh

Mac

Open the print settings dialog box. In the "Printing Modes" menu, select the "Distinguish Thin Lines" option to "On."



❑ Cautions after the completion of the adjustment

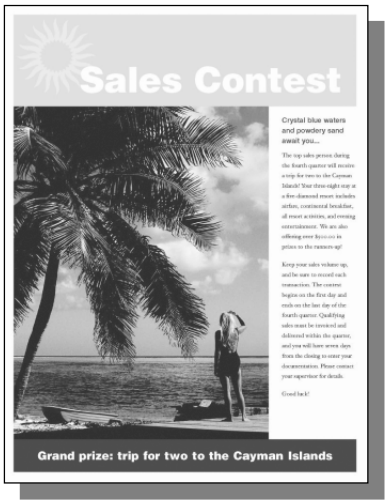
Nothing in particular.

❑ Remarks

The adjustment may not be effective to clearly print gray lines, with the "Distinguish Thin Lines" option enabled.

3.3 To Decrease the Image Density and Save Toner

Before the adjustment



Default printing.

After the adjustment

Printing is performed, while the toner is being saved.

❑ Explanation

Enable toner save mode on the printer driver or adjust the laser power output and image density level in order to reduce the amount of toner used to print the output, for instance, if a large number of copies have to be printed, or if the image density is too high.

❑ Procedures

* The procedure varies depending on whether to perform printing in toner save mode, to adjust the laser power output, or to adjust the image density level. To decrease the print density on a user-by-user or temporary basis (to decrease the print density for a particular job), refer to "3.3.1 To Perform Printing in Toner Save Mode." To constantly decrease the image density for all jobs of all users, instead of using toner save mode, refer to "3.3.2 To Adjust the Laser Power Output" or "3.3.3 To Adjust the Image Density Level." Note that "3.3.2 To Adjust the Laser Power Output" applies only to the e-STUDIO350/450 (not to the STUDIO200L/230/230L/280/280S.)

3.3.1 To Perform Printing in Toner Save Mode

The e-STUDIO350/450 and the e-STUDIO200L/230/230L/280/280S offers toner save mode. It is intended to automatically decrease the image density and reduce the amount of toner used to print the output. Enable toner save mode on the printer driver.

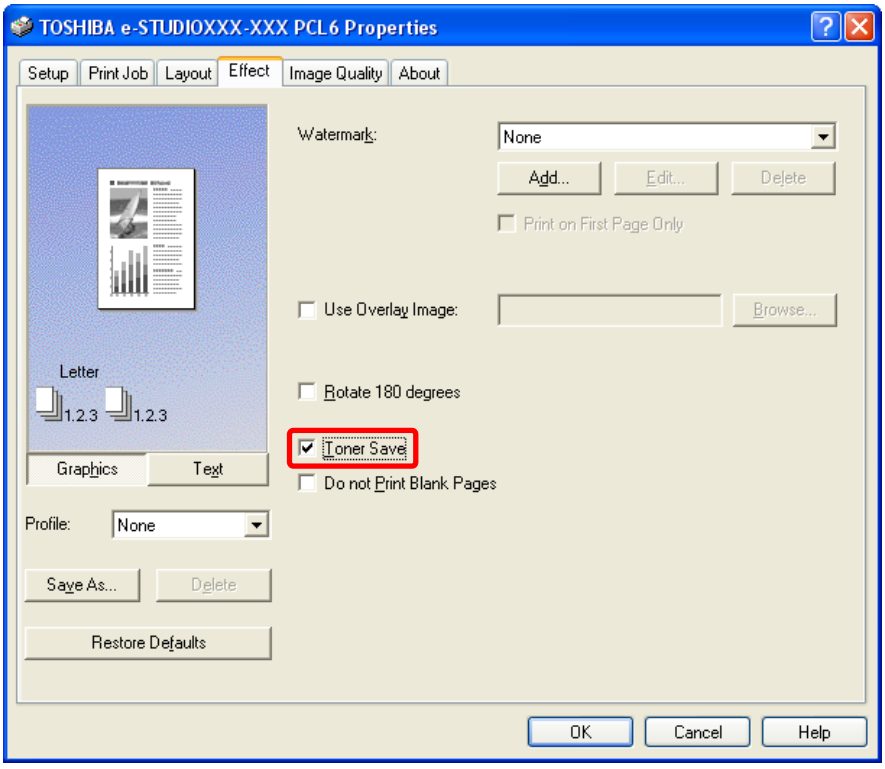
*The adjustment is performed by the service technician, and by the user.

(1) Enable toner save mode on the printer driver.

For Windows

PCL6 PS3

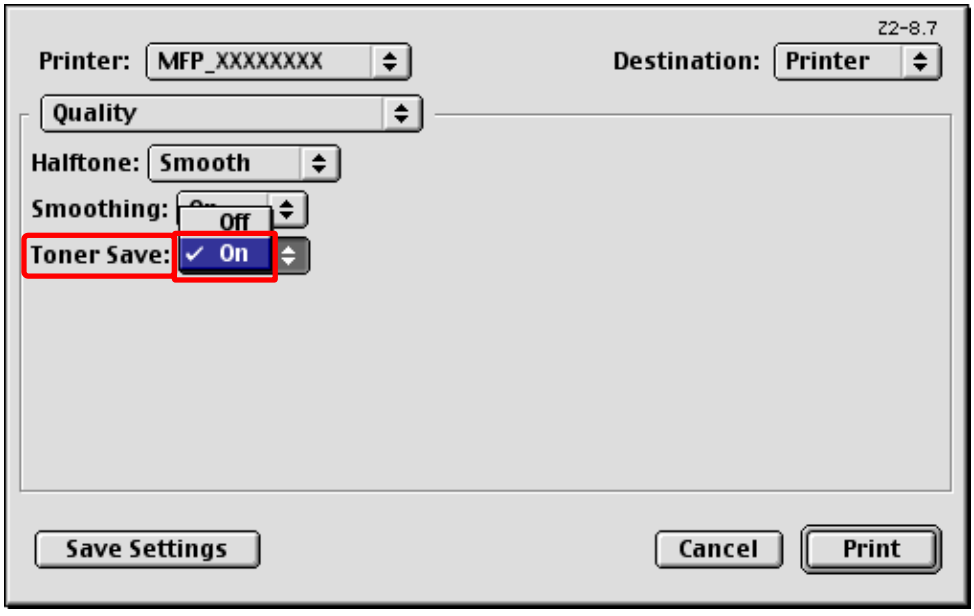
Open the property page of the printer driver. Mark the "Toner Save" checkbox in the "Effect" tab.



For Macintosh

Mac

Open the print settings dialog box. In the "Quality" menu, select the "Toner Save" option to "On."



❑ Cautions after the completion of the adjustment

The adjustment may possibly cause degradation in photo or gradational images (less accurate reproduction of halftones) and provide lower image density than required (decreased resolving power). Therefore, carefully perform the adjustment, while checking the printout.

❑ Remarks

- The effect of the adjustment may vary, depending on the usage pattern of the consumables, such as the developer material and drum, and the operating environment of the copier.

- The image density in toner save mode can also be adjusted. For further information regarding the adjustment procedures, refer to 3.4 To Adjust the Image Density in Toner Save Mode.

3.3.2 To Adjust the Laser Power Output (e-STUDIO350/450 only)

* This adjustment applies only to the e-STUDIO350/450. Never perform the adjustment on the e-STUDIO200L/230/230L/280/280S, or a service call "CA20" (H-sync detection error) will occur.

* The service technician must perform the adjustment in accordance with the procedures below.

PCL6 PS3 Mac

(1) Enter setting mode [08]. Decrease the value for code [872] to reduce the intensity of the laser, which the drum is irradiated with.
  • Change the value for code 08-872 to "113." (The default value is "128.")

After adjusting the laser power output, print and check the print image quality.
If further image quality adjustments are still necessary, use the next procedure.

PCL6 PS3 Mac

(2) Enter setting mode [08]. Set a value smaller than the current one for code [872].
  • Change the value for code 08-872 to "98."

  <Note> Remember that if the value set for code 08-872 is smaller than "98," this may cause service call "CA20" (H-sync detection error).

❑ Cautions after the completion of the adjustment

The adjustment may possibly cause degradation in photo or gradational images (less accurate reproduction of halftones). Also, it may provide lower image density than required (decreased resolving power), cause a faint thin line, and shorten the life of the consumables. Therefore, carefully perform the adjustment, while checking the printout.

❑ Remarks

• Enter the value mentioned in the procedures. Otherwise, it may produce little effect on the image quality. In addition, it may cause a loss in copier performance, including degradation in the image quality and reduction in the life of the consumables.

• The effect of the adjustment may vary, depending on the usage pattern of the consumables, such as the developer material and drum, and the operating environment of the copier.

3.3.3 To Adjust the Image Density Level

* The service technician must perform the adjustment in accordance with the procedures below.

PCL6 PS3 Mac

(1) Enter adjustment mode [05]. Decrease the value for code [672] to decrease each image density level.

For e-STUDIO350/450

[05] code	Subcode	Value recommended			Default
		Pattern A	Pattern B	Pattern C	
05-672	0	0 (Fixed)	0 (Fixed)	0 (Fixed)	0
	1	4	4	2	4
	2	5	5	3	5
	3	6	6	4	6
	4	8	6	5	10

For e-STUDIO200L/230/230L/280/280S

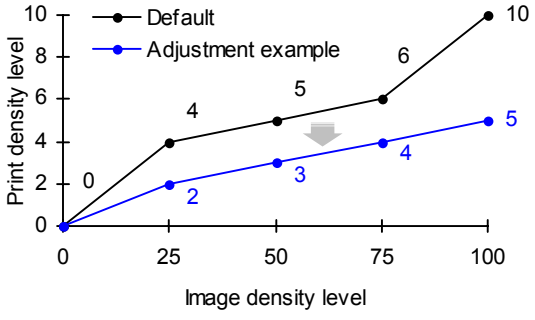
[05] code	Subcode	Value recommended			Default
		Pattern A	Pattern B	Pattern C	
05-672	0	0 (Fixed)	0 (Fixed)	0 (Fixed)	0
	1	4	2	1	4
	2	5	3	2	5
	3	6	4	3	6
	4	7	5	4	10

* The recommended image density value for each pattern is as follows as a guideline. It is recommended to print the Pattern "A" and check the image quality first, then the Pattern "B" and Pattern "C" in order, if further adjustments are required

- Pattern A: The image density is slightly lighter than the default setting
- Pattern B: The image density is lighter than the default setting. (Same image density as that in the toner save mode)
- Pattern C: The image density is greatly lighter than the default setting.

* The subcode varies, according to the image density level to be adjusted. Refer to the table and the graph below and set the subcode for the image density level to be adjusted. Never change the value for Subcode "0" (image density level "0"), or an image problem may occur.

Subcode	Image density level to be adjusted
0	0
1	25
2	50
3	75
4	100



* Correlation of image density level value among subcode numbers should be that the higher the subcode number is, the higher the image density level value is. If the image density level value for a lower subcode number is greater than that for a higher subcode number, an image quality problem may occur.

  Ex.: When the image density level for 672-0, 672-1, 672-2, 672-3, and 672-4 is assumed to be "A0", "A1", "A2", "A3", and "A4" respectively, they should have the following correlation:

  $A0 \leq A1 \leq A2 \leq A3 \leq A4$

After adjusting the image density, print and check the print image quality.

❑ Cautions after the completion of the adjustment

The adjustment may possibly cause degradation in photo or gradational images (less accurate reproduction of halftones) and provide lower image density than required (decreased resolving power). Therefore, carefully perform the adjustment, while checking the printout.

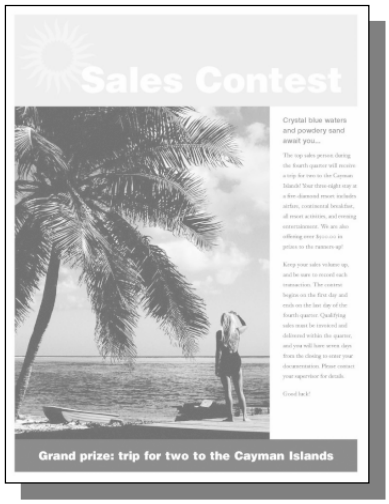
❑ Remarks

- Enter the value recommended in the procedure for adjustment.

- The effect of the adjustment may vary, depending on the usage pattern of the consumables, such as the developer material and drum, and the operating environment of the copier.

3.4 To Adjust the Image Density in Toner Save Mode

Before the adjustment



The image density is too dark, even when printing is performed in toner save mode.

After the adjustment

The image density in toner save mode is adjustable, as desired.

❑ Explanation

The e-STUDIO350/450 and the e-STUDIO200L/230/230L/280/280S offer “toner save mode.” It is intended to automatically decrease the image density and reduce the amount of toner used to print the output. Adjust the laser power output or image density level in toner save mode, in order to obtain the desired image density.

❑ Procedure

* The procedure varies among the following cases: "3.4.1 To Adjust the Laser Power Output in Toner Save Mode" and "3.4.2 To Adjust the Image Density Level in toner save mode". Refer to each procedure as necessary. Note that "3.4.1 To Adjust the Laser Power Output in Toner Save Mode" applies only to the e-STUDIO350/450 (not to the e-STUDIO200L/230/230L/280/280S).

3.4.1 To Adjust the Laser Power Output in Toner Save Mode (e-STUDIO350/450 only)

* This adjustment applies only to the e-STUDIO350/450. Never perform the adjustment on the e-STUDIO200L/230/230L/280/280S, or a service call "CA20" (H-sync detection error) will occur.

* The service technician must perform the adjustment in accordance with the procedures below.

PCL6 PS3 Mac

(1) Enter setting mode [08]. Decrease the value for code [875] to adjust the intensity of the laser, which the drum is irradiated with.

[08] code	Value recommended	Acceptable value range	Default
08-875	To decrease the image density: 113 to 127 To increase the image density: 129 to 158	0 to 255	128

<Note> If the image density in toner save mode is increased, the amount of toner consumed may not be reduced even in toner save mode.

❑ Cautions after the completion of the adjustment

The adjustment may possibly cause degradation in photo or gradational images (less accurate reproduction of halftones). In addition, it may increase the amount of toner used (if the image density is increased) or cause the faint print image (if the image density is decreased). Also, it may shorten the life of the consumables. Therefore, carefully perform the adjustment, while checking the printout.

❑ Remarks

- Enter the value mentioned in the procedures. Otherwise, it may produce little effect on the image quality. In addition, it may cause a loss in copier performance, including degradation in the image quality and reduction in the life of the consumables.

- The effect of the adjustment may vary, depending on the usage pattern of the consumables, such as the developer material and drum, and the operating environment of the copier.

3.4.2 To Adjust the Image Density Level in Toner Save Mode

*The service technician must perform the adjustment in accordance with the procedures below.

PCL6 PS3 Mac

(1) Enter adjustment mode [05]. Change the value for code [676] to increase or decrease each image density level.

For e-STUDIO350/450

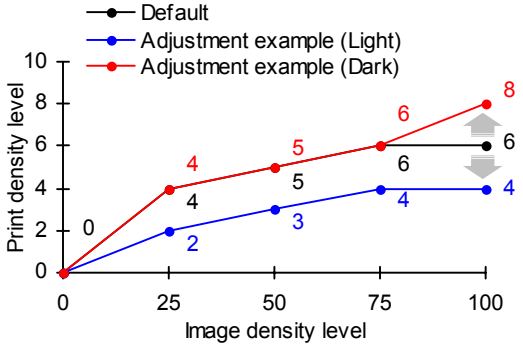
[05] code	Subcode	Value recommended		Default
		To decrease the image density level	To increase the image density level	
05-676	0	0 (Fixed)	0 (Fixed)	0
	1	2	4	4
	2	3	5	5
	3	4	6	6
	4	4	8	6

For e-STUDIO200L/230/230L/280/280S

[05] code	Subcode	Value recommended		Default
		To decrease the image density level	To increase the image density level	
05-676	0	0 (Fixed)	0 (Fixed)	0
	1	1	3	2
	2	2	4	3
	3	3	5	4
	4	4	6	5

*The subcode varies, according to the image density level to be adjusted. Refer to the table and the graph below and set the subcode for the image density level to be adjusted. Never change the value for Subcode "0" (image density level "0"), or an image problem may occur.

Subcode	Image density level to be adjusted
0	0
1	25
2	50
3	75
4	100



*Correlation of image density level value among subcode numbers should be that the higher the subcode number is, the higher the image density level value is. If the image density level value for a lower subcode number is greater than that for a higher subcode number, an image quality problem may occur.

Ex.: When the image density level for 672-0, 672-1, 672-2, 672-3, and 672-4 is assumed to be "A0", "A1", "A2", "A3", and "A4" respectively, they should have the following correlation:

$A0 \leq A1 \leq A2 \leq A3 \leq A4$

After adjusting the image density, print and check the print image quality.

❑ Cautions after the completion of the adjustment

The adjustment may possibly cause degradation in photo or gradational images (less accurate reproduction of halftones). In addition, it may increase the amount of toner used (if the image density is increased) or cause the faint print image (if the image density is decreased). Also, it may shorten the life of the consumables. Therefore, carefully perform the adjustment, while checking the printout.

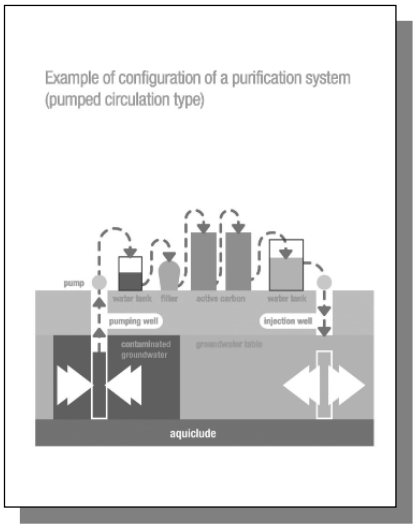
❑ Remarks

• Enter the value recommended in the procedure for adjustment.

• The effect of the adjustment may vary, depending on the usage pattern of the consumables, such as the developer material and drum, and the operating environment of the copier.

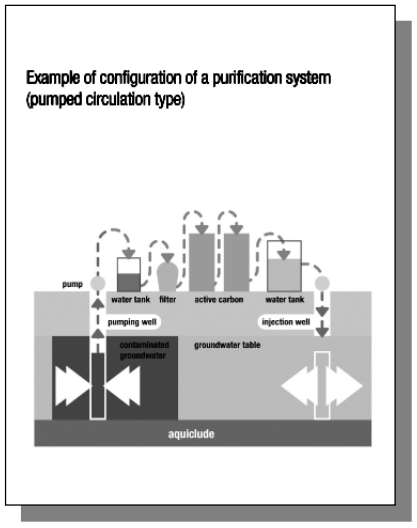
3.5 To Print Illegible Gray or Colored Text in Black

Before the adjustment



Gray text is illegible on the printout.

After the adjustment



The gray text is printed in black. This makes it more legible on the printout.

❑ Explanation

When a full-color original is printed in black and white, the colored text may turn gray on the printout and eventually become illegible. In this case, change the printer driver settings, in order to reproduce the colored text (except white text) in black and make it more legible on the printout.

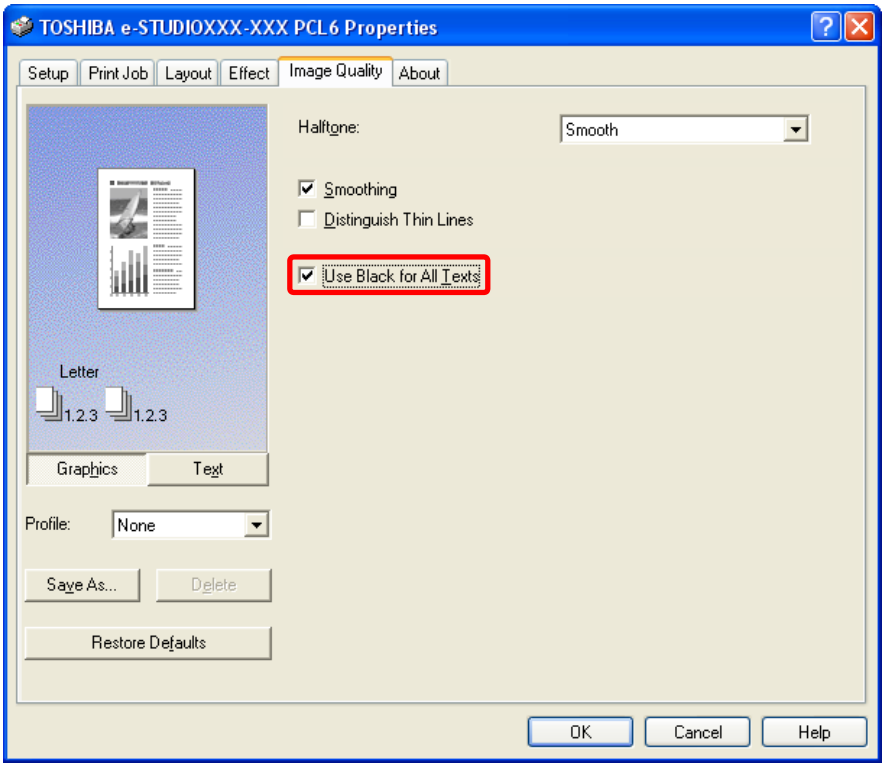
* This adjustment cannot be performed on the Macintosh printer driver.

❑ Procedure

* The adjustment is performed by the service technician, and by the user.

PCL6 PS3

(1) Open the property page of the printer driver. Mark the "Use Black for All Texts" checkbox in the "Image Quality" tab.



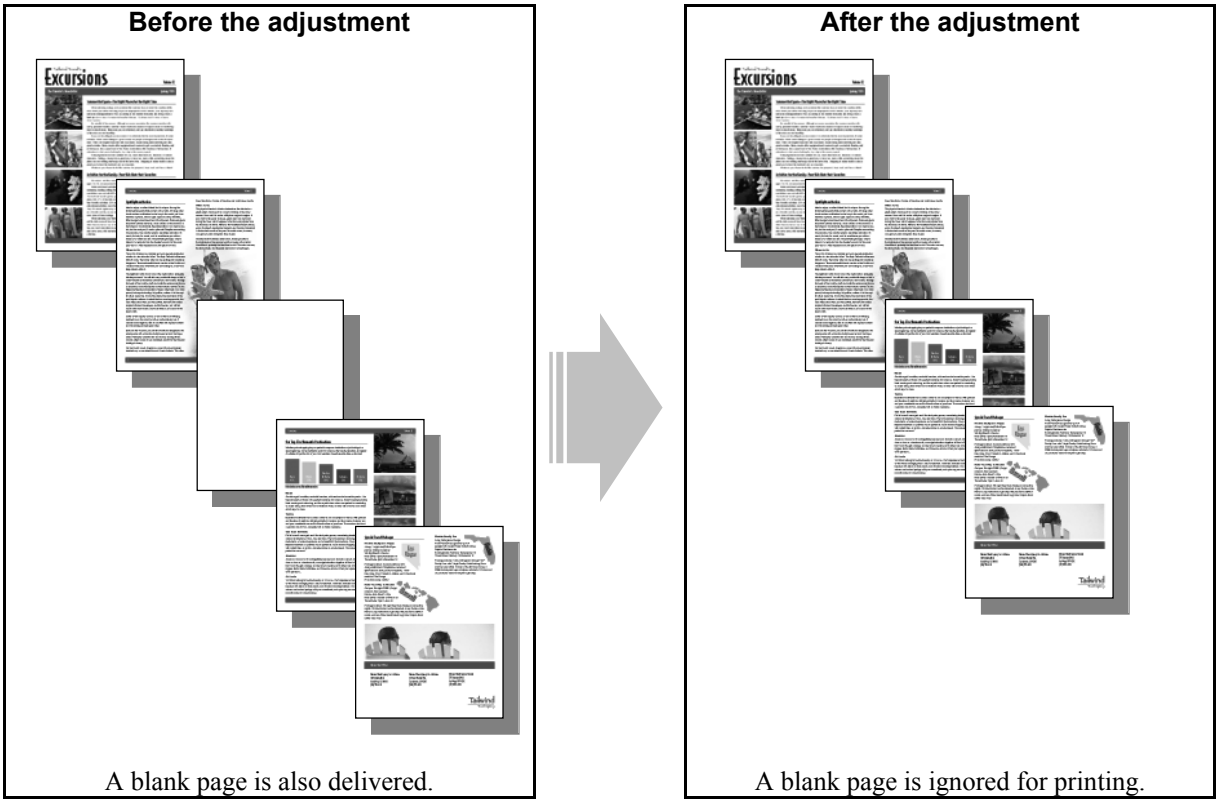
❑ Cautions after the completion of the adjustment

Nothing in particular.

❑ Remarks

Not all colored text (e.g. extremely large-sized text) may be printed in black.

3.6 To Ignore Blank Pages for Printing



❑ Explanation

Some applications may be designed to automatically insert blank pages for laying out the pages of a document. Change the printer driver setting, in order to ignore all blank pages for printing.

❑ Procedure

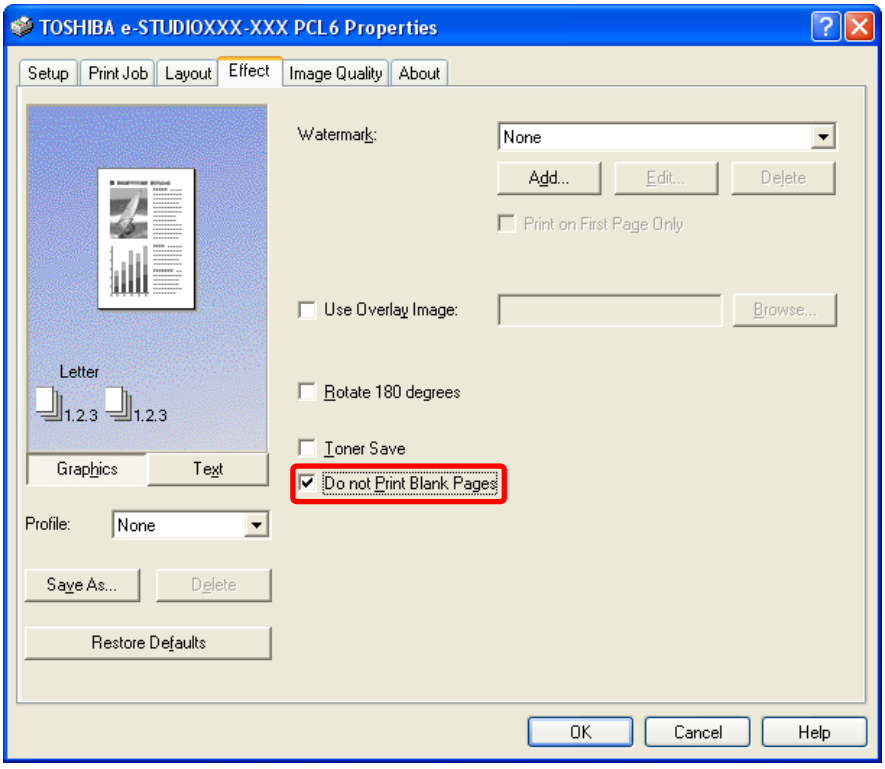
* The adjustment is performed by the service technician, and by the user.

(1) Mark the "Do not Print Blank Pages" checkbox on the printer driver.

For Windows

PCL6 PS3

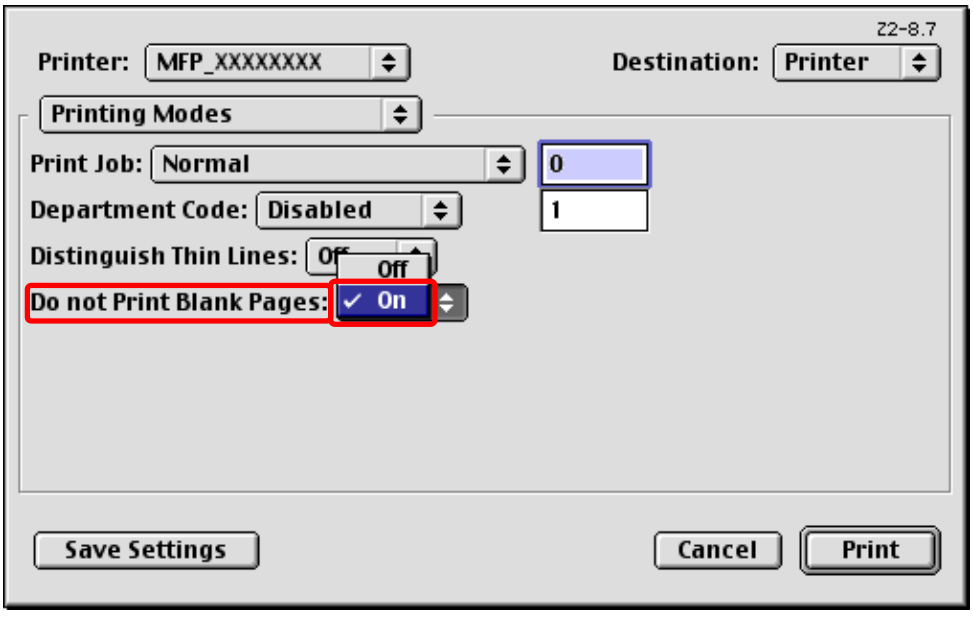
Open the property page of the printer driver. Mark the "Do not Print Blank Pages" checkbox in the "Effect" tab.



For Macintosh

Mac

Open the print settings dialog box. In the "Printing Modes" menu, select the "Do not Print Blank Pages" option to "On."



❑ Cautions after the completion of the adjustment

The adjustment may possibly cause the functions in the "Layout" tab (Booklet printing, N-up printing, Use Front Cover, Use Back Cover and Interleave Pages) not to work, as programmed. Therefore, pay special attention to a combination of the functions to be used.

❑ Remarks

If any data is inserted in the header or footer of a particular page on Excel or Word, even though no data is present in the body, the page will not be recognized as a blank page. The header or footer will be printed out.

4.1 To Store the B/W Original with Photos and Text with the High Density

(To change the density in Copy to Box)

Before the adjustment

The black-and-white image is stored in Photo mode. When it is opened on an application, text looks very light.

After the adjustment

If it is stored in Text or Text/Photo mode, text will look darker and clearer.

❑ Explanation

When a black-and-white original containing both photo images and text is copied and stored in the e-Filing box (Copy to Box), text may be stored with the low-density, depending on the type of original, because Photo mode is intended to improve the reproducibility of halftones. Change the original mode option and adjust the scan density, in order to obtain a darker and clearer image, when the image stored in the e-Filing box is to be imported into an application on a client PC.

* Please remember that the e-Filing functions are available only on the Windows platform, but not on the Macintosh or UNIX platform.

❑ Procedures

* All the adjustments are performed by the service technician, and by the user.

Copy to Box

(1) Press the [BASIC] button on the Control Panel. Select [TEXT] or [TEXT/PHOTO] from among the original mode options.

* Copying the original in Text mode may diminish the quality of photo images. If there is a problem with the image stored in Text mode, switch to Text/Photo mode.

* Use either of the following procedures to switch default original mode to Text mode or Text/Photo mode:

To change default original mode on the Control Panel

• Use steps (a) to (d) to change default original mode.

(a) Press the [USER FUNCTIONS] button on the Control Panel to enter the "User Functions" menu.

(b) Press the [USER] button.

(c) Press the [COPY] button.

(d) In the "ORIGINAL MODE" option, press the desired button to specify default mode.

To change default original mode in setting mode [08]

• Enter setting mode [08]. Change the value for code [550]. The specified original mode option will be selected by default at power-on.

Value for 08-550	Default original mode at power-on
0	Text/Photo (default)
1	Photo
2	Text
3	Custom

* Custom mode can be selected, if it has already been enabled using code 08-508. To use Custom mode, the image quality in Custom mode needs to be programmed beforehand, in order to obtain the image quality, which the user desires. For further information regarding the Custom mode setting, refer to 2.7 To Program Frequently Used Copy Settings.

After changing original mode, store the original and check the image quality.
If further image quality adjustments are still necessary, use the next procedure.

Copy to Box

(2) Press the [BASIC] button on the Control Panel. Press the [◗] button to increase the copy density.

❑ Cautions after the completion of the adjustment

Nothing in particular.

❑ Remarks

If this adjustment does not result in the desired image quality, it is recommended to scan the black-and-white original and store it in the e-Filing box (Scan to Box), rather than copy it. Provided that the image stored is imported into an application on a client PC, Scan to Box will provide the image most suitable for displaying on the computer monitor. Remember that copying and storing in the e-Filing box cannot be performed simultaneously.

4.2 To Store the Original Attaching Importance to Gradation Reproducibility of Printed Image

(To change gradation of the image scanned and stored by Scan to Box)

Before the adjustment

Depending on the type of original or resolution, the gradation is lost when the image is printed after being scanned and stored in the e-Filing box.

After the adjustment

The gradation is not lost even when the image is printed after being scanned and stored in the e-Filing box

❑ Explanation

When an original containing images such as photo images is scanned and stored in the e-Filing box (Scan to Box) and the scanned image data is printed directly from the e-Filing box, the gradation of the printed image may be lower than that of the original.

Scan to Box scans image data and stores it in the e-Filing box attaching importance to "image quality displayed on the computer monitor" and "image quality scanned at 200 dpi (default) and printed." As a result, depending on the type of original or scanning resolution, a printed image may be blurred due to high image density of halftones (loss of gradation.) To scan and store the original attaching greater importance to "gradation reproducibility of printed image" than "image quality displayed on the computer monitor", adjust the image processing conditions for scanning (range correction.)

* This adjustment will be effective only when the original is scanned and stored into the e-Filing box (Scan to Box), and ineffective when copied or printed and stored into the e-Filing box (Copy to Box or Print to Box.)

* This adjustment will be effective only when an original is scanned in "Text/Photo" mode or "Photo", and ineffective when scanned in "Text" mode.

* This adjustment should be performed before an original is scanned and stored in the e-Filing box. Note that the image quality of the images already stored in the e-Filing box cannot be adjusted.

❑ Procedures

* The adjustment is performed by the service technician only.

Scan to Box

(1) Enter adjustment mode [05]. Increase the value for code [820/822] to change the text peak of range correction and make the copy image look white (light). (Decrease the number of pixels to be identified as "black" by range correction.)

• The code to use varies, according to original mode (Text/Photo or Photo). Adjust the value for the [05] code corresponding to original mode for which you would like to improve the image quality.

Original mode	[05] code	Value recommended	Acceptable value range	Default
Text/Photo	05-820	Approx. 232	0 to 255	224
Photo	05-822	Approx. 253		239

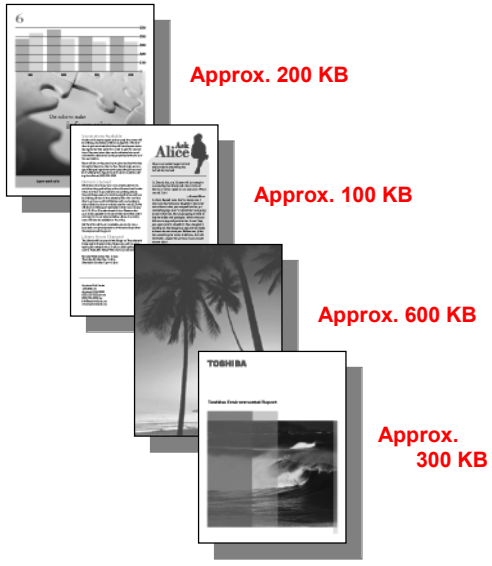
After adjusting the number of pixels, scan the original, store it in the e-Filing box (Scan to Box), print it and check the print image quality.

❑ Cautions after the completion of the adjustment

The adjustment provides lower image density than the default setting where "image density of the scanned image displayed on the computer monitor" or "image density scanned at 200 dpi and printed" is important. As the adjustment results are applied to subsequent scanning and storing (Scan to Box), it is recommended to make adjustment based on the originals or settings which the user frequently uses.

5.1 To Scan the Original, while Reducing the File Size

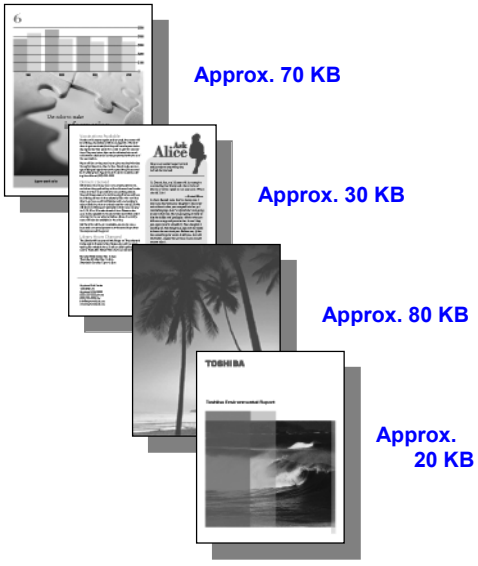
Before the adjustment



* The above file sizes are just for your reference.

If the original is constantly scanned at the default compression rate, the file size will become larger than required.

After the adjustment



* The above file sizes are just for your reference.

If the original is scanned at a reasonable compression rate, depending on the purpose of the scanned-in image, the file size will be successfully reduced.

❑ Explanation

If an original is scanned at the default settings, a proper image will be obtained for general purposes. But the file size may become larger than required. The file size of the scanned-in image significantly varies, depending on the selected resolution or original mode. If an appropriate resolution and an original mode option are selected in accordance with the purpose of the original, the image quality will be maintained, while the file size is being reduced. Change the resolution and original mode, in order to minimize the file size of the scanned-in image.

❑ Procedures

* You can start with any of the procedures. But it is recommended to perform the procedures in order, as listed below. You can use one procedure in conjunction with another. But if this changes the image quality more than required or loses effectiveness of the adjustment, restore the settings made in the previously used procedure to the original. Then perform the next procedure.

* All the adjustments are performed by the service technician, and by the user.

(1) When scanning the original, press the [EDIT] button on the Control Panel. Select a lower resolution option in the "RESOLUTION" option.
* In the "RESOLUTION" option, "200 (dpi)" is selected by default. Select a lower resolution option (150 dpi) to reduce the file size.

After changing the resolution, scan the original and check the scanned-in image quality.
If further image quality adjustments are still necessary, use the next procedure.

(2) When scanning the original, press the [EDIT] button on the Control Panel. In the "ORIGINAL MODE" option, select [TEXT].
* Perform this adjustment, only if the original containing no photo images is scanned or if degradation in the photo image quality is acceptable.
* This adjustment will be effective, only if [TEXT/PHOTO] or [PHOTO] is initially selected from among the original mode options.

After changing original mode, scan the original and check the scanned-in image quality.
If further image quality adjustments are still necessary, use the next procedure.

❑ Cautions after the completion of the adjustment

• The table below shows you the correlation between the adjustment and file size. (The ratio of the file size may vary, depending on the type of original. Therefore, use the table below just for your reference.)

• Correlation between a resolution and file size (procedure (1))

* The file size in a resolution of 200 dpi is 100%.

Resolution	File size ratio
200 dpi	100%
150 dpi	Approx. 60%

• Correlation between original mode and file size (procedure (2))

* The file size in Photo mode (200 dpi) is 100%.

Original mode	File size ratio
Photo	100%
Text	Approx. 20%

• The adjustment may possibly cause small-sized text to become illegible or make a photo or gradational image look blurred. Therefore, carefully perform the adjustment, while checking the scanned-in image.

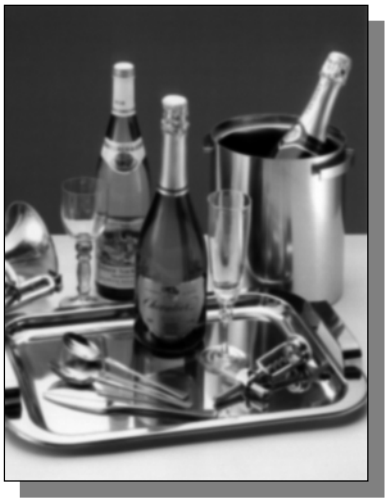
❑ Remarks

Use the following steps to change the default resolution and/or original mode options:

(a) Press the [USER FUNCTIONS] button on the Control Panel to enter the "User Functions" menu.
(b) Press the [USER] button.
(c) Press the [SCAN] button.
(d) In the "RESOLUTION" and/or "ORIGINAL MODE" option, press the desired button to change the default.

5.2 To Sharply Scan the Original (To increase the sharpness intensity)

Before the adjustment



The image looks too soft and blurred.

After the adjustment

The edges are enhanced. The image looks sharp.

❑ Explanation

Adjust the sharpness intensity, in order to sharply scan the soft and blurred original.

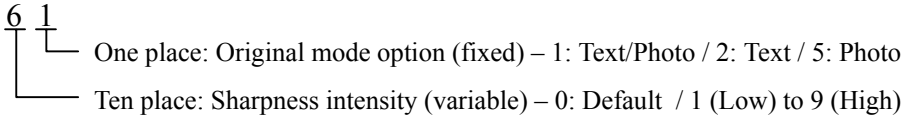
❑ Procedure

* The adjustment is performed by the service technician only.

(1) Enter adjustment mode [05]. Increase the value for code [865/866/867] to increase the sharpness intensity.

• The code to use varies, according to original mode (Text, Text/Photo or Photo). Adjust the value for the [05] code corresponding to original mode for which you would like to improve the image quality and change the value set in ten place.
(Change the value in ten place to "3" or more in Text mode, or "4" or more in Text/Photo mode and Photo mode. The sharpness intensity will be increased, compared with the one provided by default.)

* Set value (Ex.: The sharpness intensity in Text/Photo mode (code 05-865) is "6.")


6 1
One place: Original mode option (fixed) – 1: Text/Photo / 2: Text / 5: Photo
Ten place: Sharpness intensity (variable) – 0: Default / 1 (Low) to 9 (High)

Original mode	[05] code	Subcode	Value recommended	Default
Text	05-866	0/1/2	Set a larger value in ten place than the current one.	02
Text/Photo	05-865	0/1/2		01
Photo	05-867	0/1/2		05

* The subcode varies, according to the resolution for which the sharpness intensity is adjusted. Refer to the table below and set the subcode for the resolution to be adjusted.

Subcode	Resolution to be adjusted
0	150 dpi, 200 dpi
1	300 dpi, 400 dpi
2	600 dpi

* With "0" set in ten place, the following sharpness intensity is provided as the default value in each original mode:

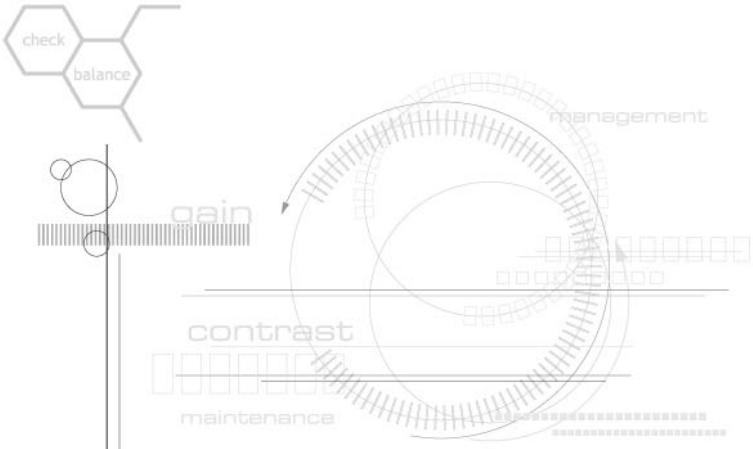
• "0" set in Text mode: The image becomes sharper than the one obtained when "2" is set, but softer than the one obtained when "3" is set.

• "0" set in Text/Photo mode: The image becomes sharper than the one obtained when "3" is set, but softer than the one obtained when "4" is set.

• "0" set in Photo mode: The image becomes sharper than the one obtained when "3" is set, but softer than the one obtained when "4" is set.

❑ Cautions after the completion of the adjustment

The adjustment may possibly cause moiré. In addition, when text and thin lines in a colored background are scanned, the background around the text or line may be eliminated. Therefore, carefully perform the adjustment, while checking the scanned-in image.



Imaging Manual

e-STUDIO350/450

e-STUDIO200L/230/230L/280/280S

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